# THE CULTIVATOR:

## A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE.—*Wash.*

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## THE CULTIVATOR.

### TO IMPROVE THE SOIL AND THE MIND.

#### Our three first Volumes.

☞ The second edition of vol. 1, and the first edition of the 2d and 3d vols. of the Cultivator, being about expended, and the demand for them continuing unabated, we are printing another edition, which will be completed with all despatch. Orders will, in the mean time, be received, and the volumes forwarded as soon as published. When completed, stitched and bound volumes will be forwarded to our agents in Boston, N. York, Philadelphia, Baltimore, Alexandria, &c.

☞ Our brethren of the type, who have borrowed any of the cuts belonging to the three first volumes, are requested to return them without delay.

☞ We treat our readers, in this number, with more than thirty interesting communications from correspondents, residing in different states, upon various branches of rural economy—and almost the whole of them are from practical, intelligent farmers. We doubt whether there is a periodical in this country, or any other, so well sustained by the voluntary contributions of practical farmers.

#### Mr. Coleman's Report.

We proceed to notice, according to promise, the first report of Mr. Coleman, on the agricultural survey of Massachusetts, embracing the county of Essex. The object of an agricultural survey, our readers we presume need not be told, is to describe a district of country, its soil, sources of fertility, products and farming operations—and whatever may be useful to the state, in promoting the improvement of agriculture, developing its sources of wealth, and multiplying the comforts and enjoyments of its inhabitants. The report before us is well calculated to promote these primary and legitimate objects of civil government. By a faithful detail of the best practices in husbandry—and many of those described in the report are well deserving of commendation,—the farmers of the state are enabled mutually to profit by the skill and improvements of each other,—each one may adopt whatever he finds excellent in the practice of others—and thus render the intelligence of all in a measure subservient to his individual profit. Besides, to quote from the report—

"If the survey results in no other good, it will present, I hope, in their true light, the motives which the children of Massachusetts have to stay at home. Her rewards to industry, enterprise, and good conduct, directed by intelligence, and under the guidance of temperance and prudence in the cultivation of her soil, are sufficient to satisfy every reasonable desire. Her social institutions and privileges are pre-eminent; and such as no new and unsubdued territory can expect to reach, under the most favorable circumstances, even in half a century.

"Filial reverence and affection are honorable traits of character, and among the highest duties of religion. Let the children of Massachusetts then honor and love their old mother. Her soil may be hard; but labor compels it to be bountiful. Her climate may be harsh; but it gives strength and elasticity to the muscles, and the brightness of its own stars to the mind. Her voice in winter may be sometimes hoarse, and her face wrinkled and frowning; but her children will not love her less for a sternness of discipline, by which she trains them up in habits of unremitting labor and self-dependence; and thus qualifies them to be the blessings and ornaments of their own community; the substantial pillars of the federal edifice; and the pioneers of learning, civilization, humanity, and religion in the boundless west."

The county of Essex lies upon the Atlantic border of Massachusetts, comprises an area of 360 square miles, and contains a population of more than 93,000. The surface is uneven and rocky, the soil of primitive formation, varying in its earthy ingredients from beach sand to stiff clay, though a gravelly loam, well adapted to husbandry, preponderates. There are extensive tracts of salt meadow on the coast, and large tracts of peaty swamp in the interior. The soil has been exhausted, like all the old settled districts of our country, by bad husbandry; and *no part of it*, says the report, *can be advantageously cultivated without manure*. The rural population are hardy, industrious, prudent, persevering, and of course prosperous. Tillage is very little practised, the main body of the land being devoted to pasturage and meadow. Much of the hay is carried to the towns, and manure brought back by the returning teams.—The tillage products are those common to the north, as grains, roots, &c. and considerable profits are drawn from the dairy. The quality of the soil is considered relatively good; but here, and in the yet unimpoverished west, it would be considered poor.

We will proceed to notice, in a summary way,

THE CROPS.

*Grasses.*—The following is given as the kinds and quantities sown: (I.) half a bushel of herds grass; (II.) half a bushel of herds grass and quarter of a pound red top; (III.) three pecks herds grass; (IV.) half a bushel herds grass, one-quarter pound red top, and one pint clover; (V.) half a bushel herds grass and half a pound red top; (VI.) one bushel herds grass, and sometimes two bushels. The herds grass here spoken of is the timothy of New-York and the south, and the red top is termed at the south herds grass. The average crop of grass seems to be from one and a half to two tons per acre, though the maximum product is given at three tons. The labor of cutting and curing an acre of grass, is rated at two days and a half of a man's labor; the average price of hay at the market, $16. The process of curing is not stated. The salt marshes yield from three-quarters to one and a quarter tons per acre—and the mean price of this hay may be stated at $10 per ton. In regard to saving herds grass (timothy) seed, the commissioner recommends, that the grass, when ripe enough, be cut when dry; allowed to lay one and a half days; tied in bundles, and set upright in a barn chamber, or on a scaffold, well ventilated, and where the scattering seed may be saved.

*Indian corn* is a staple crop; and the average expense of its culture, including manure, is given at about $40 per acre, a sum that would be appalling to a western or southern corn-grower; and yet the Essex farmer contrives to make a profit of $20 to $30 on an acre. The product is ordinarily from 40 to 70 bushels per acre, though it has been carried as high as 110 or 115 bushels. With some farmers this forms the first of a course of crops, and is planted upon sward; 2d year, corn or potatoes; 3d year, wheat, barley or oats, with grass seeds; then from three to four years in grass. Four to ten cords of manure to the acre are applied to the corn crop, which is hoed three times. The Pickwacket variety is deemed the earliest, though the Dutton has likewise ripened in favorable locations. The modes of culture and of harvesting are unfortunately omitted; though the commissioner recommends, that it be cultivated on a flat surface, without hills, in order that after the last hoeing *it may be laid down with grain and grass seeds*—a practice which we should decidedly condemn, as slovenly and particularly exhausting. Three highly exhausting crops, and all carried from the soil, in succession!! We like much better the following recommendation. The commissioner says—

"One of the most valuable improvements in the husbandry of the last twenty years, is that of planting this crop on an inverted green sward. The sward is completely turned over after vegetation has considerably advanced. The manure is applied on the *top* of the soil; and the field is then rolled in a thorough manner. The ground is next harrowed, and the corn planted either in drills or hills. When the roots of the corn pierce the sod, they find an abundant pabulum of decayed vegetable matter, equal, by as an exact calculation as can be made, to twelve tons upon an acre; and the crop is forced on, at the last of the season, when it particularly needs this stimulus and food, to great advantage."

As much as we commend this recommendation in general, and highly as we esteem the authority from which it emanates, we nevertheless venture to dissent from some of its positions. From the fact that only one pint of clover seed is sown in but one of the six modes of stooking with grass seeds, we presume the green sward recommended to be turned under "after vegetation is considerably advanced," is a tough old sward. If so, it will not be decomposed in season to afford food to the *young* corn crop, particularly without the aid of unfermented manures to accelerate fermentation and decomposition. Again: if the manure is unfermented, it will benefit the soil, ultimately, at least one-third more, if ploughed under, than if harrowed in. The recommendation will prove serviceable, in our opinion, only when applied to a *young* clover ley, and fermented manure.

*Wheat.*—The culture of this grain, "down east," is like rolling the stone up hill, except it be upon a limited scale, while the great secondary formation of the west is a competitor in the grain market. In 1827, we published in the New-England Farmer, our reasons for believing, that the primitive formation of New-England could never be a great wheat growing district, by reason of the deficiency of its soil in the salts of lime, and matters which afford azote, both found in wheat, and both indispensable in the soil to its successful culture; and we recommended the application of substances containing these essentials, as lime, bones, urine, horn, hair, night soil, the refuse of the tanner, tallow chandler, soap boiler, the offal of the butcher, the dung of fowls, soot, woollen rags, fish, &c. as proper means of giving to the soil this essential food to the wheat crop. And we remember that our friend Coleman rebuked us, and treated our views of the matter as visionary and absurd. We are happy to find that he has so far overcome his prejudice as to recommend lime, ground bones and soap-boiler's waste for wheat grounds, and to declare that some portion of the former is "deemed essential to success." This grain is however raised in Essex, on a small scale; but there is nothing mentioned of the mode of culture particularly worthy of notice. In regard to blight, Mr. Coleman states the following fact:

"Of two contiguous fields of wheat, similar in aspect, condition of soil, and kind of seed, which I visited this season, one was severely blighted, the other sound and perfect. The only difference ascertainable in the management of the two fields, was that one of the farmers, during the continuance of the heavy dews, and damp foggy weather, which occurred while the wheat was in flower, was careful every morning to sweep the dew from his wheat by passing a rope over it."

As the notice of the other farm crops contains nothing particularly notable, we merely make the following extract, describing a mode of preserving the potato. It would, however, be an improvement if the starch alone were retained, as the residue is of little use.

"Potatoes may be preserved by being rasped or ground to a pulp, and afterwards pressed with a heavy press, and then dried like cheese. Potato cakes of this sort have been found to keep perfectly sweet for years; and it is thought that ships bound on long voyages might find it advantageous to take their potatoes in this form."

Onions, carrots, beets and cabbages are cultivated profitably as garden crops for market. The produce of half an acre, in garden vegetables, is stated to have sold for $363.67.

*The Dairy* is on a limited scale, and little butter or cheese is sent to market. The commissioner states, that it requires a gallon of new milk to make a pound of cheese; that from two and a half to three gallons are required to make a pound of butter. "The cheese usually sells for eight or nine cents; the butter for 20 to 22. When cheese is worth nine cents, butter should be worth 22; the value of the milk then applied either way is the same. The skimmed milk and butter-milk, however, are of much more value for various domestic purposes, and for feeding swine, than the cheese whey. The labor of the manufacture is not very different. The care of the cheese, where it is kept through the season, is considerable. The yield of a cow in milk is stated generally at 350 gallons per year; of butter 87½, 116, 140 lbs.; of cheese I have not been able to obtain any return on which I could place any reliance." These data are worth remembering. Essex butter is stated to be inferior to the butter of Pennsylvania and New-York; and the commissioner hints at some of the causes of this difference, and suggests correctives.

*The Sheep Husbandry* is very limited, there being only about 6,000 sheep in the county. The com-

missioner thinks it may be profitably increased, in fattening wethers and rearing lambs for market. He estimates that the former may be fattened 12 weeks, upon hay and corn meal, for $2.54; and that they will then bring him $5.50 to $6.00—no great profit after paying $3.00 in the outset.

*Beef.*—The fattening of beef is extensively pursued, and the weight of some heavy cattle are recorded. Corn meal and potatoes, and in some cases apples, are the principal auxiliaries to hay, in the fattening process. A peck of meal and a bushel of potatoes are fed per day to a pair of fattening oxen.

*Swine.*—The Byfield breed, of some celebrity, originated in this county. The practice of cooking food for swine is recommended. "In an exact experiment," says the commissioner, "made by myself a few years since in this county, the largest gain ascertained was more than three pounds live weight; that is, 57 lbs. in 18 days. This was obtained on pure Indian hasty pudding."

Under the head of *Neat Cattle*, the report details the great product of several cows; but as this seems to have been owing to high feeding, and select individuals, rather than to particular breeds, we omit these details. The stock most prevalent is a mixed breed, termed "native stock," in which the Devon generally preponderates.

The chapter on *Manures* is valuable, particularly where, as in Essex, a farmer is content to pay $5.50 a cord for cow dung, and cart it four miles. Stable dung is in high repute, and sells at a very high price; yet there exists many other sources of fertility yet but partially brought into notice, which the commissioner names, as clover and other green crops, peat earth, sea ooze, sea drift, oyster and clam shells converted into lime, the refuse of the manufactories of almost every kind, leached ashes, and gypsum in the interior. Prof. Hitchcock's report cannot fail to enlighten the farmers of Essex on the interesting subject of manures.

We shall omit, for the present, any further notice of the report, and close this article with some suggestions of what we think would be manifest improvements in the husbandry of Essex. And,

*First.*—The root culture, particularly the ruta baga crop, might be beneficially extended, as a material for feeding and fattening farm stock, making manure and ameliorating the soil. Half a bushel of potatoes and half a peck of corn meal are stated to be a ration for a fattening bullock. Estimating the average potato crop at 160 bushels per acre, and of the corn at 40 bushels, an acre of each would give 320 rations to a fattening ox. Two bushels of ruta baga per diem, would be fully an equivalent for the half bushel of potatoes and half peck of corn meal, and we think would do more in the fattening process. An acre of ruta baga would give about as many rations as the acre of potatoes and acre of corn together, and could be cultivated and harvested at less expense than either; would not be so exhausting as the corn, and would add much, probably a third, to the manure. Thus, one half of the labor, and one half of the land might be saved.

*Second.*—By more generally alternating grain, grass and roots, for which the soil seems to be generally adapted, less manure would be required to keep up fertility, and the crops would unquestionably all be improved. We have treated this subject so fully in our article upon the new husbandry, that any further remarks are deemed unnecessary at present.

*Third.*—The culture of clover, with all small grain crops, as a means of *dividing and enriching the soil*, we think would certainly prove beneficial. The tap roots of this plant are admirably adapted to the amelioration of the soil; and supposing the ley to afford only half the vegetable matter furnished by old green sward, it would give six tons of manure to every acre which it is employed to fertilize. This, as manure is there valued, would be worth at least $20 the acre—a very liberal return for 60 or 70 cents expended in seed. And where gypsum exercises its magic powers, this would hardly fail to prove a reasonable result.

We shall take an early opportunity of resuming our notice of this report.

### Geological Science applied to Agriculture.

We are obliged to our friend, the Rev. Mr. Coleman, for a copy of the last report of Prof. Hitchcock, being "*A re-examination of the Economical Geology of Massachusetts*;" or, in other words, geological science rendered subservient to the improvement of agriculture. It is a pamphlet of great interest, and we venture to class it among the most valuable works of the literature of American husbandry. It discusses with ability the sources of fertility, the causes of deterioration, and the means of renovating, our soils.—It describes the origin of soils; gives a classification of them, and a table of analysis; explains the properties of marls and lime,—the theory of their action upon soils, and the practical application of this theory; and it develops the fertilizing properties of marsh mud, muck sand, and other natural products, which abound in the state, and which may be brought to aid agricultural improvement. The work is a happy illustration of the vast benefit which science is capable of imparting to our husbandry.

We had occasion, in the second number of the current volume, to speak of the properties of *humus*, otherwise *ulmin*, or vegetable extract, the great source of fertility to soils. In the report before us, this indispensable food of vegetables is denominated *geine*, a name first given to it by Barzelius. The following extracts, which are in the language of Dr. Dana, of Lowell, will enlighten our readers further on this subject, and serve to demonstrate, that all animal and vegetable substances are convertible into the food of plants;—that they constitute the proper food of plants;—that all organic matter may be again transmuted into organic matter;—and that the alkalies, salts and atmospheric air, with which dung more or less abounds, are indispensable agents in converting dead into living organic matter—into grains, grasses, and roots,

"By *geine*," says Dr. Dana, "I mean all the decomposed organic matter of the soil. It results chiefly from vegetable decomposition; animal substances contain a similar compound containing azote." * * "Geine exists in two states: soluble and insoluble: soluble both in water and in alkali, in alcohol and in acids. The immediate result of recent decomposition of vegetable fibre is abundantly soluble in water. It is what is called solution of vegetable extract. Air converts this soluble into *solid* geine,* *still partially soluble in water*, wholly soluble in alkali. Insoluble geine is the result of the decomposition of solid geine; but this insoluble geine, by the long continued action of air and moisture, is again so altered as to become soluble. It is speedily converted, by the action of lime, into soluble geine.†—Soluble geine acts neither as alkali or acid. *It is converted into a substance having acid properties by the action of alkali*, and in this state combines with earths, alkalies and oxides, forming neutral salts, which may be termed *geates*. These are more soluble in water than solid geine; especially when they are first formed.—Their solubility in cold water is as follows: beginning with the easiest, magnesia—lime, manganese, peroxide of iron—(it does not unite with protoxide of iron,) alumina, baryta. The geates of the alkaline earths are decomposed by carbonated alkali. The geates of alumina and of metallic oxides are soluble in caustic or carbonated alkali without decomposition. The geates of the alkaline earths, by the action of the carbonic acid of the air, become *super-geates*, always more soluble than neutral salts. Soluble geine, therefore, includes the watery solution—the solid extract caused by the action of the air on the solution, and the combinations of this with alkalies, earths and oxides. Insoluble geine includes all the other forms of this substance."

"Soluble geine is the food of plants. Insoluble geine becomes food by air and moisture. Hence the reason and result of tillage. Hence the reason of employing pearlash to separate soluble and insoluble geine in analysis."

"These are facts. Will they not lead us to a rational account of the use of clay, lime, ashes and spent ley? Will they not account for the superiority of unfermented over fermented dung in some cases?

"Geine forms the basis of all the nourishing parts of vegetable manures. The relations of soils to heat and moisture depend chiefly on geine. It is in fact, under its three states of "vegetable extract, geine and carbonaceous mould," the principle which gives fertility to soils long after the action of common manure has ceased. In these three states it is essentially the same. Of all the problems to be solved by agricultural chemistry, none is of so great practical importance as the determination of the quantity of soluble and insoluble geine in soils. This is a question of much higher importance than the nature and proportion of the earthy constituents and soluble salts of soils. It lies at the foundation of all successful cultivation. Its importance has not been so much overlooked as undervalued. Hence, on this point the least light has been reflected from the labors of Davy and Chaptal. It needs but a glance at any analysis of soils, to see that fertility depends not on the proportion of the earthy ingredients. Among the few facts best established in chemical agriculture, are these: that a soil, whose earthy part is composed wholly, or chiefly, of one earth; or any soil, with excess of salts, is always barren; and that plants grow equally well in all soils, destitute of *geine*, up to the period of fructification,—failing of geine, the fruit fails, the plant dies. Earths, and salts, and geine, constitute, then, all that is essential; and soils will be fertile, in proportion as the last is mixed with the first. *The earths are the plates, the salts the seasoning, and the geine the food of plants.* The salts can be varied but very little in their proportions, without injury. The earths admit of wide variety in their nature and proportions. I would resolve all into 'granitic sand;' by which I mean the finely divided, almost impalpable mixture of the detritus of granite, gneiss, mica slate, sienite and argillite; the last giving by analysis a compound very similar to the former. When we look at the analysis of vegetables, we find these inorganic principles constant constituents—silica, lime, magnesia, oxide of iron, potash, soda, and sulphuric and phosphoric acids. Hence these will be found constituents of all soils. The phosphates have been overlooked from the known difficulty of detecting phosphoric acid. Phosphate of lime is so easily soluble when combined with mucilage or gelantine, that it is among the first principles of soils exhausted.—Doubtless the good effects, the lasting effects, of bone manure, depend more on the phosphate of lime, than on its animal portion. Though the same plants growing in different soils are found to yield variable quantities of the *salts* and earthy compounds; yet I believe, that accurate analysis will show, that similar parts of the same species, at the same age, always contain the inorganic principles above named, when grown in soils naturally arising from the decomposition of granitic rocks. These inorganic substances will be found not only in constant quantity, but always in definite proportion to the vegetable portion of each plant. The effect of cultivation may depend, therefore, much more on the introduction of *salts* than has generally been supposed. The *salts* introduce new breeds. So long as the salts and the earths exist in the soil, so long will they form voltaic batteries with the roots of growing plants, by which the 'granitic sand' is decomposed, and the nascent earths, in this state readily soluble, are taken up by the absorbents of the roots, always a living, never a mechanical operation. Hence, so long as the soil is *granitic*, using the term as above defined, so long is it as good as on the day of its deposition; *salts* and *geine* may vary, and must be modified by cultivation. The universal diffusion of granitic diluvium will always afford enough of the earthy ingredients. The fertile character of soils, I presume, will not be found dependent on any particular rock formation on which it reposes. Modified they may be, to a certain extent, by peculiar formations; but all our granitic rocks afford, when decomposed, all those inorganic principles which plants demand. This is so true, that on this point the farmer already knows all that chemistry can teach him. Clay and sand every one knows: a soil too sandy, too clayey, may be modified by mixture; but the best possible mixture does not give fertility. That depends on salts and geine, [manures.] If these views are correct, the few properties of geine which I have mentioned will lead us at once to a simple and accurate mode of analyzing soils—a mode which determines at once the value of a soil, from its quantity of soluble and insoluble vegetable nutriment,—a mode, requiring no array of apparatus, nor delicate experimental test,—one, which the country gentleman may apply with very great accuracy; and, with a little modification, perfectly within the reach of any man who can drive a team or hold a plough."

Professor Hitchcock gives the analysis of 125 specimens of soils, with the quantity of soluble and insoluble geine, salts of lime, and granitic sand found in each, and also the absorbent power of each. Only seven of these specimens, gave indications, on analysis, of the presence of carbonate of lime, although several of them came from limestone districts. After a detailed account of the examination of soils, Professor Hitchcock adopts the following

GENERAL CONCLUSIONS.

"Without stopping," says the report, "to notice some things of minor importance, I will state at once the most important conclusions that have forced themselves upon my mind, from all my examinations and analyses of our soils, respecting their deficiencies and the means of remedying them.

"*First, the grand desideratum in our soils is calcareous matter; that is, carbonate of lime.*

"*The second desideratum is, an additional quantity of geine; that is, a larger supply of the food of plants.*

"*Hence, thirdly, the great object of the agricultural chemist should be, to discover and bring to light new supplies of both these substances.*

"The discovery of either of them would, indeed, be of no small value; but it is a principle that never ought to be lost sight of, that an additional quantity of lime in the soil, will commonly require an additional quantity of organic matter, [manure] and an increase of the latter will be far more serviceable, if attended by an increase of the former.

"These fundamental principles and conclusions I have kept in view continually; and will now proceed to show with what success I have searched for new sources of lime and geine. I shall begin with the former as the most important, because the farmer already possesses the means of increasing the quantity of his manure, but not of obtaining calcareous matter; for, with the exception of Berkshire county, Massachusetts is very deficient in limestone."

We shall resume, hereafter, the subject of this report, and at least enumerate the fertilizing materials of which it takes cognizance.

* Hence the impropriety of summer yarding manures.

† Hence the use of lime in soils abounding in inert vegetable matters, or insoluble geine.

### The North and the South.

The remark is often made in the southern journals, that the north is half a century in advance of them in agricultural and rural improvement. From what little observation we have been able to make, we are inclined to think there is some truth in the remark, though there certainly are in the south many individual and highly honorable exceptions. The exhausting system of continual cropping, has been so long

persisted in at the south,* that perhaps millions of acres have become so impoverished as to be thrown into commons—and turned over to nature to renovate their fertility, by a slow growth of cedars, pines and chinquepins. We confess that in some districts of the north our condition is but little better; but in general we have long since commenced a better system, which is now going on with spirit. By clover and plaster, alternating crops, root culture, drainmg, increase of farm stock, and economy in saving and applying manures, we have renovated much of our once exhausted, and reclaimed much of our waste lands, and rendered them highly productive and profitable. Yet at the north the work of improvement is but begun.

There has, besides, been less attention paid to the comforts and embellishments of HOME in the south than in the north. The buildings, particularly those denominated out-buildings, court-yards and gardens, receive less attention at the south than they do at the north. A traveller, in describing this contrast to us, remarked, that in one case the owner seemed to be AT HOME—in the other, NOT AT HOME—that one, like the bee, appeared to be gathering the sweets of life from a diversity of rural and interesting objects, as it were in detail, while the other was looking for enjoyment principally in the products of his broad-spread fields, and by wholesale.

There is evidently, however, a difference, in favor of the north, in the manner of managing farm lands, principally, we believe, growing out of education and habit. If there is not more science, there is at least more practical knowledge in husbandry at the north than at the south; and these are both essential to an improved state of husbandry. Poor Richard says,

"He that by the plough would thrive,
"Himself must either *hold* or *drive*."

The northern farmer generally does one or both, either from choice or necessity. He is the manager, if not the laborer. It is too often the case in the south, we fear, that the planter, personally, neither *holds* nor *drives*. Hence the mismanagement of his land and the deterioration of his soil. Where labor is held to be menial, the principles upon which it ought to be conducted are often overlooked. A knowledge of these principles, acquired in youth, with the supervision of their application in practice, would soon impart a relish for rural pursuits, increase their profits, and greatly improve the general appearance of the country. The sentiment of Washington, that there is "no pursuit, in which more real and important service can be rendered to any country, than by improving its agriculture," backed, as it was, by his efforts to improve his own and the agriculture of his country, should be a sufficient stimulus to the generous minded and chivalrous young gentlemen of the south to imitate his illustrious example,—to study the principles of the parent art, and to understand so much of its practical routine, as to be able to direct its labors with skill and profit. We recommend this course, not only as a source of profit, but of high intellectual enjoyment and substantial comfort. An education in a practical and theoretical school of agriculture, at the north, would enable the young gentlemen of the south to manage their estates far better than they are now managed, without abstracting from their respectability, their rational enjoyments, or their usefulness to society. Such schools we hope yet to see in successful operation among us, and to see their blessings, agricultural, moral and political, diffused into every portion of the Union, in despite of the fatuitous policy, which seems yet to prevail, in regard to this matter, in our halls of legislation.

### The Grain Worm.

The legislature not having offered any reward for the discovery of a preventive to the destructive ravages of this insect, our offer of a premium of FIFTY DOLLARS for such discovery remains in force. The editors of the Yankee Farmer have offered a like reward of THIRTY DOLLARS. What gentleman will authorize us to add 50, 40, 30, 20, or 10 dollars to the reward? The evil is one of great magnitude, involving the interests, more or less, of every member of the community. If the reward should be justly claimed, millions will be saved to the state. If it is not claimed, no one will be the loser. We invite millers, merchants, land-owners, farmers—all—to weigh the matter deliberately, and permit us to register their names as contributors to this fund, in such sums as they are willing to give.

* A letter just received, and now before us, dated Eastville, Va. says—"*All* our cleared lands are divided into two equal fields, one of which is planted in Indian corn, and the other sown with oats alternately, every year, except some manured lots, which are appropriated to sweet potatoes, on which all the manure is put which can be had from the most negligent and slovenly husbandry. I presume an average crop of maize is from six to seven bushels to the acre, and from five to seven bushels of oats." It is no wonder, that under *such* a system of farming, lands should soon be worn out.

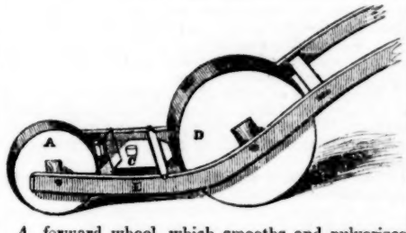
### Small's Plough.

We have seen this plough in operation, under the management of two excellent ploughmen, who fully concur with us in opinion, that it is constructed on an excellent model, that it performs its work fast and well, promises to be durable, is of easy draught, and, what is a matter of some consideration, is moderate in price,—it being sold at the factory, in Argyle, Washington county, at $8, and in Albany at $9—two extra points for $1 additional. It has been brought to its present improved state by Mr. Wm. Small, an experienced and intelligent Scotch ploughman. It is for sale by W. Thorburn and J. H. Loucks, in Albany, and by Mr. Small in Argyle. We can with confidence recommend it as an excellent implement.

### Bushnel's Drill Barrow.

We noticed in our August No. of last year a rough model of this implement, exhibited before the viewing committee of the State Society, described its parts, and pointed out some of its advantages. Mr. Bushnel, we are glad to learn, has built many drill barrows after the model exhibited, and finds a ready sale for them. He has placed some in the hands of our neighbor Thorburn, for sale, at $6, and sells them at his shop at $5. We shall speak more particularly of this implement after we have given it a thorough trial, which we design to do, having one in our possession; yet we doubt not but its operation will prove satisfactory. Address S. H. Bushnel, Sheffield, Mass. To those unacquainted with the value of the drill barrow, in sowing seeds in row culture, it may not be amiss to observe, that with one a man may sow three or four acres per day, of ruta baga or other seeds.

[Fig. No. 34.]




*A.* forward wheel, which smooths and pulverizes the surface. *B. B.* the shafts and handles. *C.* the hopper, between which and the forward wheel is the coulter, not seen in the view; and behind which is the brush or rake that covers the seed. *D.* the after wheel, which presses the earth upon the seed.

### The Grain Crop.

We are gratified in the news from the south and the west, that winter grain generally promises a good crop, where it is not likely to be visited by the grain worm; but this insect enemy may be expected to reach Westchester on the south, and the valley of Genesee west, the coming summer. And it is no less gratifying to learn, by a gentleman from the northern part of Vermont, where the worm seems first to have made its appearance on our continent, some eight or ten years ago, that this scourge is no longer seen in those parts. We hope that in neither case will our information prove illusory.

### "Half Farmers."

There is truth in the remark, that lumbermen and fishermen make poor farmers. These employments take men from home when they are most wanted on their farms; farming becomes with them a secondary business; and, besides, their constitutions become impaired, and their habits unsettled, by these employments. Farming will not thrive generally in any district where fish or lumber constitute staples of trade. And we have fancied, and it may have been nothing but fancy, that in passing out of New-York, where the farmers are generally *all farmer*, into New-England, that there was a marked falling off in the management of farms—which we ascribed to the proneness of our Yankee brethren to be "*jacks at all trades*," which, as the adage teaches, renders them "*good at none*." The truth is, there is hardly a business in life upon which a man's *whole* time, talent and capital becomes so *progressively* productive as that of farming—nor in which at least the two first are so essential to eminent profit and success. A correspondent, who dates at Susquehanna, N. Y. complains bitterly of the wretched state of husbandry in his vicinage, not owing, he says, to the infertility of the soil, which is good, but to the lumbering business, which, while it enriches a few, so impoverishes the many "half farmers," that they are barely able, with the greatest exertions, to "make both ends meet." We do not know how the evil is to be remedied, unless these "half farmers" will quit the water, take the Cultivator, and study and follow its maxims, which will not fail to make them

"Healthy, wealthy and wise,"

as poor Richard says. Then may our correspondent see his hopes realized.

### What has the Legislature done for Agriculture?

From the indications given in our March and April numbers, many persons, as well as ourselves, were led to hope and expect, that our legislature would have made a just, if not a generous appropriation, in aid of the improvement of our agriculture,—and they were lauded abroad for the liberal provisions which they were expected to make in its behalf. But alas! the session has gone by, and nothing has been done, and hardly attempted to be done, in furtherance of this great branch of industry. A bill was reported in assembly, by Mr. Allen, and some discussion had upon its merits; but no question was taken which fairly tested the sense of the house. Indeed, such was the boyish scramble for popularity, by shortening the session, and such the urgency of individual and corporate claims upon their attention, that the representatives had but little time to devote to the humble claims of agriculture. There were many thousand dollars appropriated to literary schools, and some millions to aid incorporated companies, but not a cent in direct aid of the great body of the people who follow the business of farming. And what is the most astonishing, and will hardly be believed by the coming generation, the farmers in the legislature were mostly disinclined to make the anticipated appropriations! We ardently hope, that the sons of *such* farmers will possess more wisdom than their fathers, and that they will ere long occupy their places in our legislative halls.

### Agricultural Implements.

We mention, for the benefit of our subscribers in Virginia and the neighboring states, that an extensive manufactory of agricultural implements has been sometime in operation at Richmond, Va., under the direction of Jabez Parker; and that the implements furnished from his shop, as threshing machines, straw cutters and corn shellers, are, according to the Richmond Enquirer, particularly excellent. Labor-saving machines, like those above named, as well as cultivators, drill barrows, horse rakes, &c. add much to the profits of farm labor, and are becoming almost indispensable in spirited and profitable husbandry.

### Agricultural School.

A highly respected correspondent, who makes farming his pleasure and sole business, and who, by his example, is enlightening and benefitting those around him,—expresses his disappointment and mortification, at the failure of our legislature to adopt an enlightened and liberal policy in regard to the improvement of our agriculture. In a letter to us, he says—

"I presume we went into the field too soon for the harvest. The time is not yet come—the Cultivator has not done its perfect work; but I feel assured it will do it in time; and until then, it will be to little purpose to force on a people a benefit they do not appreciate or wish.

"Any thing within the compass of individual enterprise and philanthropy, may still succeed, and be carried through, to the benefit of the few who have learnt the value of information and acquirements, and already suspect that there is science in agriculture. I look to the establishment of agricultural schools as belonging to an earlier state of things than agricultural exhibitions.—To him who has made no advance, an agricultural exhibition, nine times in ten, is a source of mortification, and a wounding of self-love; but a school will awaken the spirit of improvement; and a few young men going forth from such an establishment, will be like a little leaven in the inert mass. I hope its consideration may be early resumed. At this moment, how many young men of education, could they enter such a school, if only for a year or two, would put their hands to the plough, as the auspicious means of providing a moderate living for the future."

### Massachusetts Premiums.

The trustees of the Massachusetts agricultural society have offered the following premiums for the best cultivated farms in that state, of not less than seventy acres, exclusive of wood land, regard being had to the quantity of produce, the manner and expense of cultivation, and the general appearance of the farm:

| | |
|---|---|
| For the first best farm, | $200 |
| For the second best, | 175 |
| For the third best, | 150 |
| For the fourth best, | 75 |

All the minutia of soil, culture, stock, manures, product, &c. are required to be stated, and the farms are to be inspected by one of the trustees or an agent. The form of application, as prescribed, is this:

"To Benj. Guild, Esq. Boston.

"Sir—The subscriber, living in the town of ——— hereby makes known his intention of applying for a premium for the best farm, and offers the same for inspection."

### Teazles

Are extensively used in our woollen manufactories. They are biennial—that is, it requires two seasons to bring the crop to maturity. They have been partially grown among us; and, under favorable circumstances, are a highly profitable crop. The following communication, copied from the Silk Grower, describes the mode of culture, and gives data as to the profits of the crop; which, allowing one half for leeway, it will be seen, is still far greater than we are accustomed to realize from ordinary farm crops.

"The soil should be rich, not sandy, but loamy; I begin to sow in the spring *not* expecting a crop till a year from next fall; in order that I may have an annual crop I adopt the following method: I sow two rows about 16 inches apart, leaving the plants about 12 inches apart; if they are too thick, I transplant them the next spring. I then leave a space of four feet for the next year's crop, which is manured by use of a hand cart. I hoe the plants well two or three times. The same piece of land, if well cultivated, will bear a good crop for several years. To make it still more profitable I sow English turnip seed on the vacant parts; in this way I raise about 200 bushels of good turnips. It does not cost any more to raise teasles than it does corn; there is no danger of the frost injuring them. I raise from 150,000 to 200,000 to the acre; they are worth this year $1.50 per thousand; some years they are worth $3 a thousand. I raised two acres of them this year; at the present prices the profit per acre is from $225 to $300; when they command $3 per thousand, the profit is from $450 to $600, which is giving five or six fold more profit than can possibly be made from corn. I generally *give* away the seed."

We add to the above, from Loudon, that the crop is taken, except the plants to be preserved for seed, about July of the second year of growth, *when the blossoms begin to fall from the top.* It is the best method to have the heads cut as they become fit, at three different times, at the distance of ten days or a fortnight from each other. The heads are cut with a knife, contrived for the purpose, with a short blade and a string attached to the haft. A pair of strong gloves is likewise necessary. The ripe heads are cut with a stem of about nine inches, tied in handfulls, put in a dry shed, and exposed to the sun, when the weather is fair, until they become perfectly dry.—When tough, and of a bright color, they are sorted into three kinds, termed kings, middlings and scrubs, and are then fit for market. *To save seed,* leave the requisite number of plants uncropped—select, when ripe, the largest and terminating heads, and thrash them with a flail.

### German Agriculture.

We know very little of the details of German agriculture; but we have read quotations from the agricultural works of Von Thaer and Sprengel;* and we have learnt from travellers, enough to desire to become better acquainted with her rural practices, conscious that they would afford valuable data for guidance in American husbandry. We have been induced to refer to this subject, by the receipt of a printed memorial of Charles Lewis Fleischmann, a graduate of the royal agricultural school of Bavaria, on the subject of improving the agriculture of this country, and printed by order of congress. We make the following extracts from this memorial, to show the advances which are making in Europe in the improvement of agriculture and of the agriculturist, by the establishment of schools of practical and scientific agriculture, and by agricultural societies and agricultural journals—and in the hope, too, that these extracts will awaken in our statesmen and our citizens generally, a better feeling—and induce a more liberal and enlightened policy—towards that great branch of productive labor, which is at once the basis of our prosperity and the palladium of our independence.

"Agriculture has made, within the last twenty years, throughout all Europe, and even in Asiatic Russia, a very successful progress. The advantage and necessity of diffusing this useful science were felt especially in Germany; there, different plans were suggested and adopted to accomplish it; agricultural societies were formed, and privileged by the governments; the divers experiments were published through journals, and prizes distributed for inventions and improvements: but all that had not the expected effect. The practical farmer, uneducated and full of prejudice, was not able to understand the principles of the new system; the man of scientific education had no experience and knowledge of applying science to practice properly; and so the most brilliant result of one improved branch was the cause of the ruin of other branches, by paying too much attention to a pet branch, and neglecting, for its sake, the whole system. This partial experimenting caused more injury than real good. Lastly, in order to diffuse the science of agriculture properly, so that every branch would affect all others advantageously, and the whole system of this so important science become perfected, it was found necessary to erect schools, and educate young men scientifically and practically. Such schools were established on large properly-conducted farms, where all the sciences were taught connected with agriculture, illustrating the practical manipulations in the field, barns, stables, &c., together with the use of all the implements and machines, as well as all the minutest branches of husbandry.

"The great *A. Thaer* brought the science of agriculture to a system, and *Burger's Lehrbuch* [manual] of agriculture was the general guide for the pupil.

"Within the short period of six years, the influence of these institutions was felt throughout the whole country. The young scientific agriculturist was employed as domain inspector, or superintendent; many applied the new science to their own estates.

"A proper rotation of crops having been introduced, with regard to the circumstances and localities, the stock increased and progressed far towards perfection; the land was ameliorated, and every part of husbandry improved; their ignorant and prejudiced neighbors became convinced; they began to imitate, and to read; and, in a short space of time, the old system was abandoned, and the farmer soon saw and realized the advantage of the science of agriculture.

"When land is rich, cheap and plenty, farming seems to be easy; but when land is poor, scarce and valuable, then the question, *'how to gain the highest clear profit under any circumstance, and to improve land and stock,'* becomes difficult.

"In general, poor soil can only be improved by animal manure. To produce animal manure cheap, and in sufficient quantity, is the most important subject of investigation for an agriculturist. It has an influence upon every branch of agriculture; from the quantity of manure necessary depends the rotation of crops, so as to produce, with least quantity of manure, the greatest quantity of food and grain, and to ameliorate the ground. From the quantity and kind of manure necessary depends the number of the domestic animals that must be kept on a given quantity of land.

"Manure has to be the first consideration in taking up poor land, and from that point start all other investigations. The cheap production of manure influences cheap production of food and grain, and is the result of high profit.

"The moment is arrived when agriculture can be brought to the highest perfection.

"Chemistry has made great progress, and has been especially treated in reference to agriculture.

"The scientific agriculturist is enabled now to make a sure and correct judgment on the experiment of the practical farmer. He can now with certainty, in advance, predict the result of every agricultural operation, and has to place no dependence on good luck, and leaves nothing to chance; neither is it necessary for him to lose time and profit, by making experiments on a small scale.

"Agricultural chemistry detects and discovers especially the secret of the life of plants, and it is therefore a necessary science for all who occupy themselves to gain products from the field, meadows, &c.

"Agricultural chemistry is that science which shows the influence of rotation and the richness of soils; it is the science which teaches how to ascertain the relative value of food, grain, straw; the value of the different kinds of manure; and to ascertain with certain success the proper food for animals, the proper kind of soil for plants, and the best manure for them.

"*Charles Sprengel* occupied himself during 20 years to apply chemistry to agriculture. He was guided by the essays of the most celebrated chemists, and has succeeded in giving the scientific world a systematical book, in which the principles of chemistry are illustrated through examples, and the theories of his doctrine applied to practice.

"Germany has many agricultural schools of great perfection; agricultural societies and journals every where; and the nobility have taken it as a pride to improve their domains, and publish their progress.

"Germany possesses eminent schools of veterinary, and distributes prizes every year for treatises on agriculture.

"Germany brings every year at least 1,000 volumes more books into market than any other nation; and the most of those books are on sciences adapted to practice. And yet how little do we know about their philosophical and scientifical transactions? And why? The German language is very little understood among a population of *English* origin.

"The first step in every undertaking is the most difficult. This difficult step this country has already taken—which is, having discovered the utility of diffusing the agricultural science. The next step is to establish agricultural schools, where that science can be taught theoretically as well as practically.

"In such agricultural schools should be taught pure mathematics, such as arithmetic and geometry; the practical application of it in mensuration, surveying, mechanics, hydraulics, hydrostatics, architecture, civil engineering, &c.; natural philosophy; chemistry, and its application to practice; zoology, botany, mineralogy, and geology; drawing; the veterinary art; and agriculture in all its branches.

"The pupils should be divided into three classes.

"The *first class* should consist of those who only want to become acquainted with the practical management of peculiar branches; for example, wool-growers. These should be paid for their services, and have a lecture every evening, *gratis;* and after serving one year or more, they could be qualified to superintend similar branches.

"*Second class,* those who desire to become acquainted with the practical management of all branches in agriculture, and the necessary rudiments of the sciences.—Terms two years, from 16 years of age and upwards.

"*Third class,* those who wish to become entirely versed in the sciences of agriculture, so as to be qualified for professorships. Term, three years.

"To illustrate the theory by practice, there should be a pattern-farm of about one thousand acres, so as to show an extensive manipulation. The farm should be conducted with the view of gaining the highest profit, so as to prove the utility and truth of the science of agriculture. A few acres of land only ought to be employed for experiments.

"The veterinary art, which teaches the external forms, as well as the internal construction and economy of the domestic animals, the proper management of them, the causes and treatment of their diseases, and the art of shoeing them, is a most important branch of an agricultural school.

"Agricultural schools of the preceding description, in which the most important sciences for a practical life are taught, would be the nursery of valuable citizens for a republic. Such men would honor and benefit the whole country; encourage and promote commerce, manufactures and internal improvement; carry public prosperity to the highest point, and increase the happiness of society."

* We do know of a more acceptable service that could be rendered to American husbandry, than the translation of these works, or a portion of them, into English. We have no doubt but the translator and publisher of them would be amply indemnified for labor and expense.

### Geological Survey of Ohio.

We have been politely furnished, by the author, with a copy of the first report on the geological survey of Ohio, by Prof. Mather. It announces the important fact, that 1,200 square miles of that state are underlaid by coal, and 5,000, by workable beds of this valuable mineral. This fact is of the utmost importance to the future welfare of that state, and of other states connected with it by water communication.—It not only ensures a permanent supply of fuel, when the native forest shall disappear, an event with which a large portion of that state is threatened from the fertility of soil, and the rapid increase of its population,—but will be all important in working the iron and the lead, with which the state is believed to abound, and in carrying on other extensive and needful manufacturing establishments. The coal formation constitutes the principal mass of the southeast portion of the state, reposes in beds of a mean thickness of six feet, lying nearly horizontal, and the coal beds are favorably situated for working, as they are found in the hills and ravines, where they can be drained with little expense, and without deep shafts and expensive machinery. Limestone is the prevailing rock, and underlays a large portion of the state. It is accessible, and well adapted to the purposes for which it is elsewhere employed. Sand stone most predominates in the coal region, and is found suitable for the most permanent works, and some answers well for grind-stones. Salt and other mineral springs are numerous. Buhr stone is found in abundance on the southern border of the state, and the value of mill stones annually manufactured from it is stated to amount to 20,000 dolls. We shall close our brief notice of this report with the following extract on

"Soils.

"The soils of Ohio are so rich, that many would suppose them scarcely capable of being rendered more productive. Art, however, is capable of improving many of them, so much as to double their produce.

"As we are almost exclusively dependent upon the soil for those articles of food and raiment necessary to the supply of our animal wants, and, as the annual products of the soil form the largest item in the increasing wealth of the state, it is deemed expedient to consider this subject with some attention. All the richest and most densely populated agricultural districts, are on the transition, secondary, tertiary and alluvial formations. Soils, with the exception of those resulting from alluvial *depositions,* are derived from the disintegration and decomposition of the subjacent materials, and they depend, in a great degree, for their qualities, upon their mechanical and chemical constitution; hence, the geology of a territory is a necessary prerequisite in estimating the agricultural characters and value of its soils.

The variations in the productiveness of soils are due to two general causes—viz.

1st. The mechanical texture of soils.

2d. Their chemical composition.

1st. The *texture* of a soil is a character of more importance than is generally supposed. To form a good soil, its texture should be such as to retain a suitable quantity of moisture for the nourishment of vegetation, and be neither so clayey as to bake and crack in the heat of the sun, or heave by the action of frost; nor so sandy as to become parched, and be mere dust at the depth to which the roots of plants penetrate. Argillaceous soils have so strong an affinity for water, as to retain a small portion even when heated. There should be a sufficient quantity of clay in soils to enable them to retain three or four per cent of water when dry, and

to convert the other materials into a loam. Perhaps a light loam, properly treated, produces the best crops.

It is also necessary to consider the substratum, in judging of the productiveness of any particular soil.—If it be clay, or rock without fissures, the soil, however good in its texture and other qualities, will probably be "cold and wet." If the sub-soil be gravel or sand, the surface soil is frequently too dry, unless it be a loam so heavy as to retain a sufficient quantity of moisture for vegetation. Where a clay sub-soil occurs, it often alternates with beds of gravel and sand. Advantage may often be taken of this geological fact to drain wet soils, either by boring, or by sinking wells through the clay, into the gravel or sand below, so that the water will find an outlet in springs at a lower level, where these strata emerge on the sides of hills or ravines. In this way, stagnant ponds and marshes may be drained, not only so as to reclaim unproductive lands, but to render the surrounding country more healthful. These principles may be practically applied in many parts of Ohio.

However poor the texture of a soil, it can always be brought to a proper state of cultivation by art; but, unfortunately, the value of produce and the price of labor will not often justify the expense. Light and heavy soils may always be benefitted by a proper admixture of clay or sand, as the case may require. That clay and sand are almost always associated, is a geological fact of much practical value in agriculture, as well as in the arts. The occurrence of one, (unless from the effect of some local cause,) is a pretty sure indication that the other may be found in the vicinity. Light dry soils are often injured by removing the small loose stones, which, instead of being an injury, are in reality an advantage, as they not only prevent the evaporation of moisture below the surface, by shading the ground; but, by their slow decomposition, furnish stimulants and food for vegetation, thus acting as a permanent manure.

"2. *Chemical composition of soils.*

"The chemical as well as the mechanical composition of soils, exerts a powerful influence on vegetation.—Salts, alkalies, and alkaline earths, act as stimulants if used moderately; but if in excess, they are injurious. Many soils contain calcareous rocks, stones, or pebbles, which are continually undergoing disintegration and solution by atmospherical agents; and thus serve as permanent mineral manures. Other soils abound in stones derived from such rocks as contain potassa as a constituent, and by their decomposition, furnish this alkali, in solution, to the roots of plants, by which it is absorbed and carried into the circulation, and there acting as a stimulant, remains combined with some vegetable acid. The decomposition of gravel, pebbles and rock has been observed to be a benefit to vegetation; and as the rapidity of decomposition depends upon the surface exposed, it follows, that if such materials be ground fine and sowed upon the soil, like plaster of paris, a more decided benefit would be the result. This has been partially tried with success; and it is to be hoped, that the intelligent farmers of this state will give it a more thorough trial.

"Iron, in some states of combination, exercises a beneficial influence on vegetation; yellowish and reddish soils almost always contain iron, and are generally productive.

"MARLS.

"The value of marls for manure is well known.—The term marl, in its strict mineralogical sense, means an argillaceous carbonate of lime, but by general usage, marl is an earthy mineral substance, (or one which becomes earthy on exposure to the weather,) which, by being spread on the soil, renders it more fertile.

"The principal varieties of marl, common in this country, are clay marls, shell marls, and the gray and green sandy marls. Clay marl, and the fresh-water shell-marl are common in Ohio; and these deposits will become valuable at no distant time.

"A rock formation of great thickness, occupying a broad belt on the surface of the state, and undoubtedly underlying a large proportion of our territory, seems to be well adapted for use as a marl. It rapidly crumbles and disintegrates on exposure.

Fresh water shell marl is formed by molluscous animals, which secrete lime from the waters of the lakes and ponds, in which they live, to form their shells; and as generation succeeds generation, the dead shells accumulating, form thick and extensive beds of this material. When the pond or lake has shoaled to within a few feet of the usual water level, a growth of plants succeeds; and by an accumulation of vegetable matter, peat and "muck" are formed, and cover the marl.—The peat and "muck" near the marl are filled with small fresh water shells, similar to those which have crumbled down to form the proper marl. The pure marl is a white crumbly mass when dry, but unctous and plastic when wet, and contains a few small white fresh water shells. If vinegar or any acid be poured on it, it effervesces briskly.

"The value of fresh water shell marl is well known to some of our intelligent farmers; but few know it when they see it, and still fewer know in what situations to find it. For these reasons; I have particularized its character and its situations. It performs the same office on the land as air-slaked lime, and is as valuable, while it has not the causticity to injure vegetation. One object in burning lime, is to reduce it to the state of powder by slaking. The shell marl is already in a pulverulent state, and only requires to be dug from the swamps and ponds and spread on the land."

### Beet Sugar.

It is announced in the New-England Farmer, on the authority of H. C. (Rev. H. Coleman,) that an important discovery has been made by a gentleman in the neighborhood of Boston, in the manufacture of sugar from beets;—by which *all* the sugar contained in these roots may be obtained; the raw material may be put in such a state of preservation as to be used in any season of the year; the process of manufacture is rendered simple and easily understood; requiring no expensive machinery, other than can be furnished by a farmer's kitchen; and the whole calculated to enable the farmer to produce his own sugar from his farm at a very small expense, compared with what this article now costs at the store. The proprietor is procuring a patent for his improvement. If these high expectations should be realized, the discovery will prove to be one of the highest importance to the country, particularly to the far west.

The following article, which we cut from a Northampton paper, has reference, probably, to the improvement above noticed, or to one very similar.

"The German improvement over the French method of making beet sugar, a patent affair in Europe, consists *simply in drying the beets*, which are then reduced to a powder by grinding, and changed into a decoction by adding water. The experiment has been thoroughly tried by Mr. Zachariah Wilder, of this town, which resulted in *complete success*. Mr. W. by this process, which, we understand, is as simple as that of making a cup of tea from aromatic herbs, has succeeded in extracting *ten per cent of sugar from the crude beet*—and he is confident that at least twelve per cent can be obtained at another experiment.—For his efforts in prosecuting his experiments to signal success, Mr. Wilder deserves the unqualified thanks of the agricultural world. The result of his labors will give an impetus to the culture of beets in Hampshire county, which cannot fail to be productive of lasting good. But to the process again. The dried powder of the beet was found to yield its saccharine immediately, as the decoction was found to be as sweet as boiled maple syrup, the moment the water was added to the powder. The means used for the clarification of the decoction were very simple. Animal charcoal and lime were the only agents employed. This eminently successful experiment proves the fact, that the immensely important article of sugar can be manufactured by any intelligent farmer's household, as easily as bread, pies or cakes can be made and baked. A rich garden spot of a quarter of an acre, can produce beets enough to make a thousand pounds of sugar; no heavy capital or incorporated company is required to carry on the business. Every individual can make a pound of sugar as cheaply and as easily as he can make a pound of Indian meal. This important fact has just been proved.—Now let us look at the amount of sugar brought into Northampton last year. Why, it amounted to *one hundred and seven thousand pounds*, which, together with the molasses consumed, would cost over $10,000. This is no inconsiderable sum to be expended by our citizens annually. A dozen resolute farmers, by their *influence* and labors combined, can create that sum from their lands this summer in the culture of the beet. At least, so we think."

*Lime for wheat.*—Dr. Jackson, geologist of the state of Maine, remarks—"I find by chemical examination of several remarkable soils, that a very minute quantity of carbonate of lime, viz. from one to two per cent, is amply sufficient to render them capable of bearing heavy crops of good wheat. I am also satisfied that a soil is incapable of producing wheat of good quality if it does not contain carbonate of lime; for this substance is an essential ingredient of this grain."

### Importance of the Salts of Lime.

"I apprehend that the importance of the salts of lime in a soil is but little appreciated by farmers.—Their crops may fail, although they may have manured and tended them well; but it is almost always easy to find a cause that satisfies, in the character of the season; but hard to convince them that the failure may have been owing to the single grain in a hundred, of some substance that can be discovered when present only by chemical examination. And yet I doubt not many a crop has failed for want of that one per cent of sulphate or phosphate of lime.—Facts, indeed, seem to me to warrant the conclusion, that, without lime in some form, land will not produce any valuable vegetation."—*Prof. Hitchcock's report of a re-examination of the economical geology of Massachusetts.*

The salts of lime referred to, as having a salutary influence upon vegetation, are the carbonates, sulphates and phosphates, or lime chemically combined with carbonic acid, as in common limestone—with sulphuric acid, as in gypsum—and with phosphoric acid, as in animal bones. These all abound, more or less, in vegetables—the sulphate particularly in clover, &c., phosphate in barley, wheat, &c., and the carbonate in many plants. As they are essential, in minute proportions, in the organization of plants, they must necessarily exist in the soil, or be formed there by chemical process, or the plants requiring them will fail for want of these necessary constituents.

*Dr. Perrine.*—This worthy citizen, formerly our consul at Campeachy, has been indefatigable and persevering in endeavoring to add to the useful plants, and consequently to the productive wealth and independence of our country. He has been at great expense in transporting to Cape Florida many tropical plants, where the climate seems congenial to their growth, which promise to be of great advantage to the arts and to commerce, particularly some which afford an excellent material for cordage. The Doctor has petitioned congress for aid, by a grant of Florida land, and a report has been made favorable to his application. We sincerely hope the recommendation of the report will be granted. *Whatever benefits a part, benefits the whole of our country;* and that the Doctor's exertions, if suitably rewarded, will lead to the most beneficial results, we have not the least doubt. And besides, what he asks will not make the country poorer, but it may enable him to be eminently useful. We repeat, we hope congress will grant his request.

☞ *An admonition.*—Most of our old farms have been worn out, or greatly impoverished, by bad management; and many of them are in the process of expensive renovation. As prevention is cheaper than cure, those who are upon new farms should be admonished, not to "kill the goose which lays the golden eggs." Constant cropping will ultimately impoverish the richest soil; as will the practice of carrying *all* off, and returning *nothing*, in the shape of manure, to the soil.

☞ *Fine Animals.*—We are happy to state, that there is now in the hands of Mr. Hall, the artist, accurate likenesses of some choice animals, belonging to an eminent American breeder, which, with a letter press description, we hope soon to exhibit to the readers of the Cultivator.

*A Nursery for sale*, containing a great variety of choice fruit trees, and many thousand seedlings, situate on the Kentucky side of the Ohio, opposite Cincinnati, with a farm and suitable buildings, if required. A professional nurseryman may obtain an advantageous bargain, by communicating with S. C. Parkhurst, Cincinnati, Ohio.

☞ *See Last Page.*

## CORRESPONDENCE.

### What is a Load of Manure?

DEAR SIR—I often see in the Cultivator, particular accounts of large crops, in which I am much interested. In these accounts, the *number of loads* of manure applied to the acre is generally stated, but I am always at a loss to know how to calculate with regard to the *quantity* of manure thus used. Some farmers call a common cart body full a load; others do not call a cart well loaded unless they have on a pair of wide sideboards full; so that the statement of a certain number of loads to the acre, without being more explicit, is only calculated to leave the reader in the dark.

I have been for some years past in the habit of drawing annually a large quantity of manure from Hartford, (six miles.) It is all measured, and we call ninety-six solid feet a load; but one of these loads will more than fill two common cart bodies. If your correspondents would always state the quantity of manure used, in cords or solid feet, all could judge more correctly with regard to the good or bad management of the person making the statement.

I find my crops generally increase in proportion to the quantity of manure used on an acre.

Yours very respectfully,

D. N. GRANT.

*Bloomfield, Conn. April* 11, 1838.

REMARK.—The general meaning of a *load of manure*, we believe, is what can be conveniently drawn by two horses or two oxen, to the field where it is to be used. At Boston and it seems at Hartford, we apprehend, it implies *as much as can be drawn by four or six cattle upon a hard road*—or "ninety six solid feet."

### Culture of Clover and Melons at the South.

*Scull Shoals, Ga. 20th April,* 1838.

Judge BUEL—I have read the numbers forwarded me with much satisfaction and improvement, and feel no hesitation in believing that they will prove highly useful to all who will read and understand them; they contain much information useful to the south, particularly the cultivation of corn and the saving of manure.

For the last three years, I have been making some experiments with red clover, timothy and orchard grass, and find that if sown about the last week in September or first in October, that we can have as good a stand of clover and grass here as you have near Albany.—From a small lot of four acres, I last June cut as fine hay

of clover and timothy as I ever saw grow at the north, it being from three to four feet high. I put about four hundred bushels of cotton seed on this land, which I have no doubt is a better manure than gypsum. On my alluvial bottoms, it thrives exceedingly well without manure, but on our exhausted fields, a good coat of manure is indispensable. When sowed in the spring it comes up well, and then dies from the heat and dryness of our climate.

I take the liberty of sending you twenty-four water melon seeds—the twelve white looking seed is called the mountain sprout, and has a rich yellow meat—and the twelve dark seed I took from a melon that weighed thirty-eight pounds, and three-fourths of a yard in length—the latter has a blood red meat. They are, without doubt, two of the most delicious varieties that can be found any where. I cultivate them thus:—I have holes dug in the ground, ten feet distant each way, eighteen inches wide at top, and twelve deep. I then have the holes filled three inches above the surface of the earth, with rich light earth, and plant and cover the seed about one and a half inches deep, leaving two stocks in a hill. The ground between the hills I keep well ploughed or harrowed until the vines begin to run. They must then be hoed often, to keep the earth light. A southern exposure on a hill side is the best, and the poorer the ground the better, except where the hill is made. I am of the opinion that any climate that will mature Indian corn, will mature the water melon.

Most respectfully,
T. N. POULLAIN.

### Improvement progressing in the South.

*Georgetown, D. C. April 25, 1838.*

J. BUEL, Esq.—Dear Sir—We have had several very cold days—ice one-quarter of an inch. Great fears were felt for the safety of the early fruit, as it was in full bloom; but I am happy to say from the best information, that it has escaped with very little or no injury. Our winter crops, wheat and rye, look well, and promise a better harvest than we have had for many years.

The spirit of improvement among our farmers is increasing daily. To give you some idea—there has been two or three times as much clover seed sown this season as last, and would have been more if it could have been had. Yours very respectfully,
JOHN H. KING.

### Miller's Tolls.

*Burlington co. N. J. 4th mo. 14th, 1838.*

FRIEND BUEL—I see in No. 1, of the present volume of the Cultivator, some complaints of the extortionate toll of the millers in your state, and am surprised to see them make no vindication of their cause in the last No. and admit it looks somewhat unfavorable to them; but such being the case, I feel disposed to defend them in some measure, at least, as I fully believe they are not as censurable as you deem them to be; as you appear to make no other deduction than the customary and with us lawful tenth, allowing nothing for filth, fixed air, nor any thing else; the former of which, with *some* customers is considerable, and in such cases, according to your standard, the miller's expense for cleaning apparatus and gratuitous labor, would only add to his condemnation; and further I apprehend you are not aware, (for if you are, you should have mentioned it,) that in solid bodies, there is fixed air, that in being reduced or pulverized escapes, and thereby a loss of weight is sustained, of which fact nine-tenths perhaps of the agricultural community are ignorant, and if so, no wonder that millers should be accused of taking too much toll. I have found by careful experiment in grinding rye, (weighing 56 lbs. per bushel,) with my own hands, long before I saw the account in the Cultivator, that it lost three and a half pounds per bushel, or twenty-one pounds in six bushels, the quantity ground, and which added to the toll, would amount to about 16 per cent.

Oliver Evans, late of Philadelphia, in his Millwright's and Miller's Guide, note pp. 159, 160, says—"If we consider that most bodies are in part composed of air, which is in a solid or fixed state, and constitutes a proportional part of their weight, and this proportion is different in different species of matter, from one-sixteenth to one-half, and in one species of wheat has been found by experiments to be one-fifth of its whole weight, that is, 12 lbs. of fixed air in 60 lbs. or one bushel of wheat." (Alas, for the miller's reputation who might grind such wheat, it being weighed before and after taking it to mill.) "Now this air is roused into action two ways, viz. by fermentation and by heat, and as fast as it is roused, it instantly leaves the body and expands itself into about a million times more space than it filled before in the form of a dense body. *See Martin's Philosophy.* As a confirmation of this hypothesis, we may observe, that many experiments have been made by weighing a quantity of wheat carefully before it was ground, and then weighing every thing it made in manufacturing, and we have found it to be lacking in weight from one to five pounds per bushel, which could not be accounted for any way better than supposing the loss to be occasioned by the escape of fixed air." This air being roused into action by heat, grinding grain when stones are dull, or glazed by garlic or the grain damp, occasioning more heat, it will consequently produce a greater escape of the air, and greater loss of weight will follow. Now thus circumstanced, can any miller possibly escape censure, though acting ever so honestly? Certainly not, and I have no doubt that owing to the ignorance of these things, and the negligence of properly cleaning their grain by some customers, many honest persons have had their reputation blasted and their incomes much curtailed, and that too upon the strongest possibly conceived evidence on the part of their accusers, viz. "weighing before and after grinding," deducting the toll only.

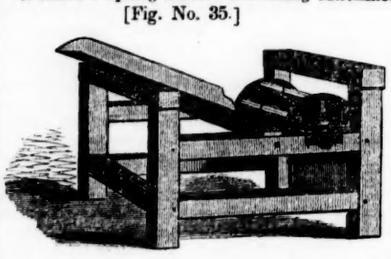
I do not make these statements as a shield for dishonesty in the least, for no doubt there are many who follow the occupation of milling, whom it would be well to keep a strict watch to; but for the information of the public, and to exonerate the upright from unmerited disgrace.

I would recommend thee to make proof of these matters by some honest miller, if there is any to be found in thy neighborhood, under thy own close inspection and observation, the motive unknown to him, and publish the result in your highly useful and interesting paper. Respectfully thy friend,
DAVID WALTON.

REMARK.—There is no doubt much truth in the remarks of our correspondent, as to the diminution in the weight of grain by grinding. But it is not so much the amount of toll which is objected to, as the want of a *legal* or other *standard* of toll, so that a customer may know when he is dishonestly dealt by; and we do not know of a better way of coming at this fact, than by "weighing before and after grinding."

### Webster's Spring Beater Threshing Machine.

[Fig. No. 35.]



The above cut represents one of D. H. Webster's machines, with the top off. It has been in use for several years—is very simple in its construction, durable, and not liable to derangement. The heads of the drum or cylinder are of cast iron, and sixteen inches in diameter, the cylinder twelve inches, and sixteen inches in length. There are four wrought iron fluted beaters extending from one head to the other, supported in the centre, the ends turned to fit in a groove in the heads which admits of half an inch play, and kept to their place by means of springs. The advantage of this play is, that in feeding, sometimes a larger quantity of grain is drawn in, and the elasticity of the springs lets it pass through. The bed plate is cast iron, with ribs running across.—The frame occupies four feet in length and two and a half in breadth.

The advantages of this machine are, safety, durability, and simplicity. Stones, pieces of roots, sticks and even a hammer has been thrown into the hopper, without injury to the machine or those attending, which in a spike machine would not only endanger those attending, but would injure and most probably destroy the machine.

With one of Allen's powers it is capable of doing as much execution, threshing as clean, and breaking the straw less than the spike machine.

This thresher was exhibited at the fair of the American Institute, in October last, for which the committee awarded him a silver medal, for the best threshing machine exhibited.

They are for sale at the store of Messrs. Geo. Russell & Brothers, corner of State-street and Middle-lane, Albany. Price $35. B.
*Albany, June, 1838.*

### Agricultural Employment Commended.

"Agriculture is the most healthy, the most useful and the most noble employment of man."—*Washington.*

Mr. EDITOR—I have made a short extract from the writings of Washington, on which to base a few plain and honest remarks. Being a man considerably advanced in life, and one of the laity, and not possessing a very good education, the reader must not expect a great display of erudition or of scholastic accuracy.—My object is to make some common-place suggestions for the encouragement and consolation of the farmer. From my youth up, I have been principally engaged in *agriculture.* Yet I have endeavored to get some knowledge of *other* occupations, so as to be able to compare and judge which is the most *healthy,* the most *useful,* and the most *noble.* And with the greatest sincerity, I can echo the sentiment of the intelligent and worthy Washington. I very well know, that this is not the opinion of many, *very many* of the community; yet it is *unquestionably* well founded. Ask the *dandies,* who are perambulating our streets, dressed in all possible finery, living upon the hard earnings of their parents, and they will tell you they consider agriculture a *dirty, degrading* business. Ask those

"Who lounge about in lazy bands,
Throng tippler's shops and tavern stands,"

and *they,* too, will tell you that farming is not the business for them. But, ask the truly intelligent and meritorious, and they will tell you that agriculture is the *main spring* of all employments. That not only the *peasant* but the *king* is served by the field. That it is not only *useful,* but highly *honorable.* They are ever ready to reiterate the sentiment contained in the following lines:

"Good Cincinnatus, at his plough,
With more true glory shone,
Than Cæsar with his laurel'd brow,
His palace and his throne."

The extract on which I have proposed to remark, contains three propositions:—The first is, of all employments, *agriculture is the most healthy.* This is evidently a fact, from the following considerations:

Man was created for *exercise.* Toil must nurture him, or else his powers and faculties will never ripen. When this cannot be brought about, he sickens and dies. Taking into consideration the regularity that may attend a farmer's labors, the regularity in meals and sleep, and the salubrity of the air he breathes, and the sun that warms and vivifies him, we at once perceive, that no employment is so well calculated to aid the functions in fulfilling their purposes. As vegetable creation is affected, so is animal. Shut out the sun and air from a vegetable, and deprive it of terraqueous, or natural aliment, and how soon it will become sickly! just so with the human family.

Again—agriculture is well calculated to afford peace of mind. A farmer's business being very much within himself, there is not that chance for altercation, disappointment, perplexity and mortification, that other men experience. Just compare with the professions. The *clergyman,* if he make every effort to give satisfaction to his parishioners, must meet with disappointment.—If he preach like one inspired, he cannot please them all.

"Some wanting grace,
Laugh in his face,
While solemnly he's prosing;
Some sneeze or cough,
Some shuffle off,
And some are even dozing."

"The *lawyer* leads a harrass'd life,
Much like a hunted otter,
And 'tween his own and other's strife,
He's always in hot water."

I should like to say something better of a *doctor's* business, but am not able.

"For like a tavern waiting man,
To every call, he's 'coming,'
Now here, now there,
Must he repair,
Or starve, sir, by denying;
Like death himself,
Unhappy elf,
He lives by other's dying."

The next proposition is, that *agriculture is the most useful.* And how can this be, when so many other employments are so useful? I will give an explanation, my dear readers, for it is very capable of illustration. The community, or the different classes of people may, very properly, be compared to the human frame, which is composed of body and limbs. All the members are very useful in their places. One cannot say to the other, I have no need of thee. Yet, we may at once perceive, that they are not equally important. A *leg* or an *arm* may be amputated, and yet the person or the body may survive; though it must be a great loss. But kill the *body,* and the limbs will die also. So with the community. The farmers are the *body,* the other classes are the *limbs.* Now amputate or cut off these limbs from society, the body may survive, though it must of course suffer much. But destroy the body, or farming interest, and all is lost.

The third and last proposition is, that *agriculture is the most noble.* This is acknowledged by all noble minds. It is what heaven ordained that man should pursue. It is the business in which our first parents were engaged. It is the business that has and must sustain the human family. It is noble in itself—it produces noble effects. How it ought to ennoble the mind, to be employed so much among the works of nature. How it ought to lead the mind from nature up to nature's God.

"A farmer's life 's the life for me,
I own I love it dearly;
And ev'ry season full of glee,
I take its labor cheerly."

AN AGRICULTURIST.
*Westborough, Worcester co. Mass. May,* 1838.

### On wintering Sheep.

In *rural economy,* as well as in the *arts,* our success is generally expected to follow *industry* and attention to our husbandry; but unless we use both *care* and *skill,* our labor will be of but little use. The wise proverb, that "the hand of the diligent maketh rich," will be of little avail, unless we give proper attention to *little things. Hard work* will not advance us in prosperity unless we *work it right.* We always find some farmers' stock in good condition—and why? Because they work it right. In an adjoining fold, their neighbors remain in poor condition, notwithstanding they may be sufficiently supplied with fodder of the best quality. This farmer heeds not *little things.* He does not take up the "stich in time" to ensure success.

The season will soon arrive, when sheep require more attention than farmers in general are apt to bestow on them. To do well through the winter, they must be in good condition when they begin it. Sheep *well summered,* and got up to hay in good heart, are *half wintered.* It is with us, a very common practice to permit them to

ramble over the fields late in fall, until snow obliges the farmer to bring them into his enclosures. They may look full on the frost-bitten herbage, but it does them little good; there is but little nutriment in it.—They should be confined in dry enclosures, between the 10th and 20th of November, while in good heart, and fed on the best of early mown hay. In wintering lambs, the foundation of so much loss is more frequently laid in the fall, by leaving them to cut their own fodder until winter sets in, than by all other neglects.

The different kinds of wethers, ewes and lambs, should be separated; and each flock of a size, that they not materially get the advantage one over another. It is also necessary to keep the old and poor sheep separate. As soon as one begins to decline, it ought to be removed into the hospital, where it can receive better attention; and it is highly beneficial that dry airy sheds are prepared, that they may not be exposed to the rigors of the winter, and cold storms in the spring.

Smut or ergot was very abundant the two last sensons, on the heads of June or spear grass. When this abounds, hay must be thrown out more abundant, that they may have a selection of food. I have known large flocks nearly all destroyed by this vegetable poison. They should be winter fed to the degree of commencing the grass season in good store order, without having sustained any check in carcass or wool. It is of the utmost importance to keep them on as dry grounds as possible in the spring. Wet feet will relax the system, it introduces a general debility, and loss of appetite. One of the principle causes of the internal rot in sheep is by their wading in wet yards, and feeding on wet grounds.

We often hear the idea presented, that the *breed is nothing* and *feed is every thing;* that this is in fact all that is necessary to make fine animals; but this notion is one that ought to be exploded. Good keeping is an excellent thing, and is not doubted; the farmer that keeps his flocks well is paid down; a fat sheep requires less hay by one-fourth than a lean one; they also produce more weighty fleeces, and more lambs; but it was never known to produce any material change in animal physiology.

The yolk, or oil, which by perspiration is secreted in the wool in warm weather, returns again into the system in a cool day; this gives a fat sheep the advantage to withstand the sudden changes of the weather, better than a poor one; and this yolk adds weight to the fleece, when shorn in a hot day; by the same rule wash them in moderate weather to preserve the oil. I have often seen flocks of sheep decline in spite of all the care and feed that could be given; but in this case, it is not wholly depending on good attention and a plenty of nutritious food for a remedy; any species of animal nature will decline in a few generations, when propagated by the same family blood.

Exercise is one very essential point, which may be produced by feeding them within ten or fifteen rods of a warm fount of water, that should not stand in a bleak windy field; and if they can have another barn or stack to run to once a day, it will give them exercise, a change of food and an appetite. To satiate their thirst on snow for a length of time is a wrong notion, and ought to be exploded. Unless they are fed on roots, they will not do as well without water, which should be convenient to them at all times.

It is very healthy for sheep to run among burned logs and stumps after being shorn, through the summer; the coal dust drives into the wool, and is a sure and simple remedy for ticks. I have tried no other method in summer to prevent these vermin, and have always been successful in preventing or expelling them.

Pine or hemlock tops should be put in their way, when they have been kept from the ground for any length of time, to invigorate their health. Where the hay is not salted, it is of importance also to brine it in mild weather now and then.

I always cut my mows, and first feed out one-half.

> "I then can judge on candlemas day,
> Whether I have more stock than hay."

It is also an economical way of saving fodder. Fresh hay is as much better for stock, as a slice of bread is for man, just cut from a loaf.

The agriculturists generally throughout our state, are applying their serious attention to the growing of wool, with the *hopes* of a fair remuneration for their enterprise. The price of the last clip did not range so high as was expected; still we are inclined to believe, that wool will do a shade better the present season; an unusually small stock of old wool remains on hand; it has not been so generally sold off and manufactured for a number of years, in this state. Our increase in sheep for the last five years has been very rapid. The present number may be estimated at two millions. In one township, rising seventy thousand have been assessed, and probably a greater number were owned. The average annual expense of keeping sheep in Vermont will not much exceed one dollar the head.

Dear sir—I respectfully submit the above for your consideration. And believe me, with great respect and esteem, to be, very truly, your obedient servant.

SOLOMON W. JEWETT.

*Weybridge, Vt. May,* 1838.

### Italian Spring Wheat in Ohio.

*Waterville, Lucas co. Ohio, April* 16, 1838.

J. Buel, Esq.—Sir—I have thought for some time, that I would send you the result of my experience in the culture of Italian Spring Wheat, in the valley of the Maumee, believing as I do, that the dissemination of information upon the agriculture of this region, will be acceptable to a large class of the readers of your paper. I sowed last spring, six bushels of wheat procured of J. Hathaway, of Rome, N. Y. a part upon the bottom lands of the river, and the remainder upon what is called the "second bottom," which is a light sandy soil of moderate richness. No more than ordinary care was taken with the crop, even for this country, where the business of agriculture is carried on rather loosely at the best. Some of it suffered considerably from weeds, and I was far from considering this experiment a fair trial. I harvested one hundred and twenty bushels, the product of the six bushels of seed, of plump, fair, heavy grain, in all respects as good as the seed, while from twenty-five bushels sowing of winter wheat, every way as well put in and taken care of as the other, I only harvested one hundred and sixteen bushels, so great is the loss from winter killing in this part of the state. As an evidence that I consider the spring wheat one of the most valuable acquisitions to the agriculture of this country, I have already sowed eighty bushels of my crop upon my best lands, and shall continue sowing till I have exhausted my stock. Some of the wheat is already up, and looks finely.

With respect, I am yours, &c.

HENRY REED.

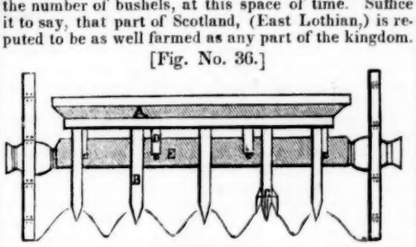
### Scotch Turnip Drill.

J. Buel—Dear Sir—When in Scotland for a time, some years since, I remarked a good method they had of cultivating ruta baga. You may have published it; if so, I have not seen it. (It is but lately I have read that excellent periodical of yours.)

It is this. Having first ploughed the land in ridges, about three feet apart; then, with a drilling machine, the drills of which are graduated to the width of the ridges, and whose wheels run in the centre of the furrows, having four or five ridges between them; the drills of the machine entering the top of each ridge, and depositing the seed there, which is covered over by two irons inclined to each other at the hinder ends, and attached to the machine.

The chief good resulting from the plan, is in the thinning out and hoeing the crop; the former is done by one stroke of the hoe between the plant to be reserved and that part of the row which is untouched, pushing the refuse plants, &c. into the furrows, leaving the proper plants, with a small portion of their roots in the ground, and blowing about in the wind, which causes them to grow the faster; (so the farmers there assert.) When the weeds are grown, and the ground requires hoeing, the ridges although flattened down in the thinning of the crop, are again submitted to the same operation of pushing and pulling the earth and weeds into the furrows on each side, where if they vegetate again, they are removed by the horse hoe, till totally eradicated. The crops grown by this method are very great, although I have no means of informing you of the number of bushels, at this space of time. Suffice it to say, that part of Scotland, (East Lothian,) is reputed to be as well farmed as any part of the kingdom.

[Fig. No. 36.]




PLAN OF DRILL.

A. Box for holding seed. B. The drills, pointed with iron, and hollow for conveying the seed to the ground. C. Irons for covering the seed. D. Pieces connecting the drill, &c. to axle tree. E. Hinge attaching the axle to the pieces, &c.

If the above is new and worthy a place in your paper, you are welcome to it. It may be interesting to some of your eastern readers, whose lands are not crowded with stumps. Yours, J. E.

*Lockport, N. Y. April* 24*th*, 1838.

### Indian Corn.

*April* 25*th*, 1838.

Jesse Buel, Esq.—Dear Sir—As every thing relative to Indian corn and its culture is particularly interesting to your subscribers throughout that great extent of our country where this grain constitutes the chief staple, I hope you will permit one who has been a corn maker for nearly half a century, to offer a few remarks upon several articles on the subject in your number for this month.

And first, of Dr. Brown and his varieties, in regard to which, as well as to his criteria for selecting seed-corn, I differ from him essentially. He has fixed upon the number of rows of grain on a cob as constituting a variety; yet *nature* has caused the same stalk of corn very often to produce ears having cob and grain exactly alike in color and shape, but differing in the number of rows upon each, from two to six or eight. Difference therefore in the number of rows, should not be considered as constituting a variety. Again, he names as a variety, but one kind of gourd seed, which he calls "genuine,"—that is the yellow—yet *nature* has made another which is white, and much more common to the south—having, not unfrequently, from twenty-four to thirty-four rows on a cob. The grain, however, has the same shape with the yellow gourd seed, and is evidently so called from its resemblance in shape to the seed of the common gourd. Of the doctor's classes, I can only say, that the rules by which he has formed them, and the characteristics which he describes as peculiar to each, appear to me both too vague and inapplicable to be useful. Some of his names, for example, are known only in a very small extent of country, and cannot of course, be intelligible at a distance; while he gives to some of his varieties the names of particular states; although in regard, at least to Virginia, I can certainly say, that it would puzzle a jury of the most experienced planters among us, to tell which variety of corn, out of fifteen or twenty, had the best right, if either had, to the name of our state. His third principal class I perceive, he has christened "Hæmatite, or blood-red."—Now if he means the second term as a translation or explanation of the first, it hardly applies to any one of the ten sub-classes which he has ranged under this chief one. In fact, it is inapplicable to any kind yet known; for hæmatite is a hard mineral substance, either *red, black or purple,* but the powder of which is *always red;* whereas, the powder of all the varieties of corn I have ever heard of is always white, or yellowish. The variety which the doctor calls "Guinea corn," if it be the same so called in Virginia, is not a corn at all, but a species of millet. His No. 32 is said to be quite as common in South-America as in Texas, where a small yellow grain corn is more generally cultivated than any other, at least in the country round about Galveston Bay. The proper name of his No. 32, is "tunicata" corn, from the circumstance of each grain having a distinct cover or coat.

Permit me now to examine his criteria for choosing seed corn. That which he ranks first is, "*the most stalk,*" and if he goes upon the principle of "first named, most honored," we have a right to conclude that the doctor considers the quantum of stalk the most valuable of all the qualities of the corn-plant. My experience tells me that it is the least valuable; for it by no means follows that the variety which has most stalk, will produce either most fodder or most grain. The first depends more on the number of joints in a stalk than on its height; for the number of joints differ materially in the different varieties, and each joint bears a blade; while the quantity of grain depends more on the number of ears, than on their relative size, and the number is almost invariable smaller on very tall stalks than on those of a medium height. In verification of this, there is no remark which is more commonly heard among us southern corn-makers, than "that corn," (speaking of some particular crop,) "is running quite too much into stalk, and shooting too high." Again—as to the value of corn stalks: no animal to which we southerners have ever offered them when dry, naked and stripped of all their blades and imperfect shoots, will eat them, unless we cook them somewhat after the recipe for making good soup with common pebbles—that is, to put in such ingredients as will make good soup of themselves, and call it "stone soup." In fact, corn stalks of themselves, are fit for little else than to act as absorbents of manure, when thrown into farm-yards, and would not be worth the labor of collecting, but for this circumstance.

The doctor's second criterion is, "*the largest cob;*" a recommendation to those who love corn cob pipes; but for nothing else. For although it is certainly true, that the largest cob will generally contain most rows of grain, yet there are several exceptions; for some varieties have very large cobs and grains comparatively broader, in all which cases the rows will be fewer in number than on cobs of equal size with narrow grains. Again—the greatest number of rows will not always produce the greatest quantity of grain by measure, unless the grain be considerably larger than the kind with which it is compared; for all which reasons I deem the doctor's second criterion no better than his first.

Let us next examine his third, which is, "*the longest grain.*" Now it is notorious to every southern corn-maker, that all the longest grain varieties are what we call "*chaffy,*" and are far less weighty, measure for measure, than the short grain varieties. This we consider a decisive proof that they have less of "*the farinaceous product,*" although I have not heard of any accurate experiments having been yet made to ascertain the fact.

The fourth and last criterion named in this fanciful classification is, "*early growth and quick culture.*" This last term, (if I understand it,) is merely an incident that may or may *not* happen to all cultivated plants whatever, but is not a quality in any. "*Early growth,*" or I should rather say, *early maturity,* is certainly a recommendation; but far more important to the north and east, than in what *may* properly be called the corn region of the United States. Within *its* limits it is universally true, that the varieties which ripen very early—say three or four weeks before the kinds most generally cultivated—although heavier are much less productive: so that his fourth criterion would be still less suitable in the southern country, than either of his others. In short, if we southern corn-makers were to go by the doctor's rules, in choosing our seed corn—rules indeed which are so incompatible with each other that they never could be true of any one of his thirty-five varieties—we should soon have to apply to some other corn doctor for farther advice.

The next remarks which I beg leave to notice relative to Indian corn, appear to be editorial. They are contained in an enumeration of the advantages of "*cutting*

*up corn,"* over the practice of *"topping it."* I cannot speak from experience in regard to the whole of them, but am confident that the writer is mistaken at least in *one* of his assertions, if he applies it to southern as well as to northern and eastern corn. He says, *"two smart men cannot top more than one acre a day."*—Where corn is planted as thick as it always is to the north, this may be, and I presume is true, as the writer states it for a fact; but in a vast extent of our southern country, wherein our corn is left to stand much thinner and more distant, two acres topping would be deemed but a poor day's work, even for *one* "smart man;" for the process with us is a very different sort of business from what it is "down east,"—our laborers having acquired, by long practice, a degree of dexterity in it incomparably greater than an eastern man who had never witnessed it, could believe possible. Again—the writer affirms, that "a hill of corn is gathered at a single blow," in cutting up; but no implement ever yet used among us will do this on our corn, where three or four stalks are left in a hill, which is sometimes the case. Indeed, it requires a strong man, with a sharp hoe always to cut up even two stalks at a single blow, after they have attained their full size.

Under the head of *"succoring corn,"* there is a remark which requires explanation. It is in the following words: "The opinion has been given, and we think well sustained—that the succors perform an important office—that the pollen of the tassels impregnates the male* blossoms after that of the main stock, which develops earlier, has been blown or fallen off."† Now I have always before been taught to believe, that the *male* of every species of animal or vegetable whatever, was the impregnat*or*, and never the impregnat*ed*. If, therefore, the male of the corn-plant is an exception, I should be highly gratified to see the proofs. Again—I am at a loss to understand to what part of the main stock the term "blossoms," is applied, for both the tassel and the silk of the ears are generally dry on southern corn, in our climate, before any pollen at all appears upon the succors, supposing them to be left.

The practice of tarring seed-corn, which Mr. L. J. Hopkins has so highly commended, is very generally followed in Virginia, and I believe in the Carolinas.—He could get thousands of planters with us to concur with him in opinion, that it is preferable to all others in preparing the seed. But care must be taken not to use too much tar, or it will injure and retard the coming up of the grain. A single pint to ten or twelve gallons of tepid water is quite sufficient. This should be well stirred before the grain is put in, after which the mixture will be found adhesive enough to attach to each grain as much gypsum or lime, (for both are used,) as may be deemed necessary.

I have been induced, sir, to offer these remarks from a thorough conviction that no subject is more interesting to a very large portion of our agricultural brethren, than that of Indian corn; and moreover that the knowledge they possess of it, still falls very far short of what it might be, if such a course of judicious experiments were instituted and persevered in, by the best informed among them, as might easily be made, and at a very moderate expense.

Should you deem the foregoing observations worth a place in your highly interesting and valuable journal, I present them to you for that purpose, and remain,

Your friend and constant reader,
CORN-PLANTER.

NOTES OF THE CONDUCTOR.

* An inadvertent error of ours. For "*male* blossoms," read "*female* blossoms," or silk. New silk frequently puts forth, in the north, after the first silk has become partially dry.

† We are inclined to favor, though we are not confirmed in this opinion. The pollen, the "impregnator," on the main stock, is sometimes blown off, or beaten off by rains, before all the silk, the "impregnated," has protruded from the husk. Hence a portion of the latter does not become impregnated by the pollen from the main stock, and the terminal end of the cob is consently barren. The tassels of the succors, being later in putting forth, and less exposed to winds, assist to complete the process of impregnation. As an evidence of this, we call to mind the fact, that the earliest ears are always best covered with grain, while those which push late often exhibit a quarter, a third, or a half of naked cob, in consequence, we presume, of want of impregnation. This explanation, we trust, will clear up the obscurity in the text, which seems to have puzzled our correspondent.

## Agricultural School.

*Albany, 16th April,* 1838.

To Hon. J. BUEL—Sir,—It is with no small degree of difficulty that I comply with the request you were pleased to make in a recent conversation I had with you, in relation to a judicious plan of instruction for the "New-York Agricultural School," and the advantages that will be likely to result therefrom; for my experience has not been extensive nor varied enough for so important a purpose. Therefore, I can only submit the following abstract, which, if it should merit your approval, and be deemed worthy of an insertion in the Cultivator, you are at liberty to make that use of it; if you think otherwise, you have my concurrence.

The chief object of the school should be to form practical mechanics, civil engineers, operative chemists, veterinary surgeons and practical agriculturists. It should be endowed with six professorships of the following subjects:

1. Mathematics and Design.
2. Rural Architecture and Civil Engineering.
3. Natural Philosophy and Practical Mechanics.
4. Geology, Mineralogy and Chemistry.
5. Entomology, Botany and Practical Husbandry.
6. Comparative Anatomy and the Veterinary Art.

The preparatory studies for entering the school should be reading, writing, English grammar, common arithmetic, history, geography, and book-keeping by single entry. No pupil should enter who is under seventeen years of age, who does not sustain a good moral character, and who has not a constitution adapted to active employment in the field.

The instruction of the school should be of two kinds, *general* and *special*.

The *general* instruction should continue two years, to be comprised of *courses* given by the professors at suitable periods, commencing each year on the first Wednesday in January, and continuing until the first Wednesday in September, from which, to the first Wednesday in December the pupils should be put under general examination upon all the branches in which they have received instruction.

During the entire courses, the pupils should be interrogated by the professors on the various branches they are pursuing, and should perform manipulations in chemistry, natural philosophy, mechanics, engineering, rural architecture, and ornamental gardening; and whenever the season would permit, to devote a portion of their time to tillage and other kinds of work connected with rural affairs, and occasionally to accompany the professors or their adjuncts on botanical and geological excursions.

The drawings should consist of plans made with the scale and dividers, and of outlines sketched by the hand relative to the courses pursued; the whole of which should be executed by the pupils, and should be duly verified by the professors. What has been said of the drawings should be repeated in regard to the manipulations. They should be sufficiently numerous to give to the pupils a positive knowledge of every branch pursued.

Independently of the interrogatories and manipulations, as stated above, the pupils should have general meetings for discussing topics relative to their studies, and for digesting memoirs upon various questions of political economy, statistics, &c.

At the end of the second scholastic year, the pupils should submit themselves for examination for their fitness or unfitness of entering the duties of their special education; and if they receive their certificate of capability, they should name, with the consent of their parents or guardians, the career for which they design themselves, and during the third year they should be practically employed in the kinds of business they intend to carry on. Should they be deemed incompetent to enter their special education, they should be permitted to repeat their course of studies, or to depart without any certificate of capability, or even of their connexion with the school.

At the general examination at the end of each scholastic year, there should be selected from the school six of the most distinguished pupils, who should serve as adjunct professors, and who should receive, besides this distinction, their instruction gratuitously during the third year. Independently of their special duties, they should assist their professors, and give elementary lessons to pupils whose preparatory studies may have been too small.

The *special* instruction should occupy the third scholastic year, during which the pupils should be actively engaged in the kinds of business for which they design to prepare themselves, whether to pursue general studies so as to qualify themselves for professors, or to become practical mechanics and civil engineers, operative chemists, manufacturers, veterinary surgeons, or practical agriculturists. They should then be placed under the special direction of the professors of the branches they pursue, who should afford them daily conferences, to point out to them a plan of operations, to follow their progress, and to designate the portions of the courses it would be useful to repeat anew.

The school should be furnished with a library of select books on mathematics, natural history, agriculture and the veterinary art. It should be provided with an extensive philosophical and chemical apparatus, and with a collection of plants, minerals and anatomical preparations. There should be constantly kept on the farm a large stock of the most useful breeds of domestic animals, and an hospital for the reception of sick animals and for veterinary practice. The farm should be large enough to produce a sufficient quantity of food and vegetables for the animals kept upon it, and to embrace as great a variety of soils as possible, and a water privilege. It should be principally tilled by the students, who should be practically instructed in the nature and composition of soils, the economy and preparation of manures, the adaptation of crops to particular soils, and the alternation of crops.

The buildings belonging to the establishment should be well constructed, and adapted to the objects for which they are intended. The laboratories and work-shops designed for manipulation and experiments should be spacious, so that a large number of students can labor in them at a time. There should be attached to the school a carpenter and wood-turner's shop, and of a mounter and turner of metals. Workmen should be employed under the eyes of the students, whether in constructing models for the collection of the school, or in making parts of machinery ordered by the pupils in their exercises, and to give them proper notions upon the handling of tools, the use of the forge, &c.

In fine, there should be placed in the hands of the students all the materials necessary for the construction of agricultural implements and machines, and such as are employed in rural architecture; and, in order to give the work as practical a character as possible, they should have at their disposal a certain number of models, implements, and machines which they can put up and take down, to operate, and to submit to such trials as will enable them to estimate their useful effect.

There should be connected with the school, either directly or indirectly, into which the students could be introduced in order to study the operation, establishments for the fabrication of chemical products; for the making of charcoal from wood; for the preparation of coke; for the extraction of marine salt; for the preparation of lime, gypsum, potash and soda; for the making and refining of sugar; for the preparation of wine, beer, cider, oils, tallow; and for the manufacture of flour, starch, soap, candles, and numerous other products; which would afford the students means to acquire a practical knowledge of the labors relative to their fabrication.

Such is a general plan of what may be deemed proper to improve the condition of our agriculture. Independently of the special objects of this seminary, young men will find a positive education, which will inspire them with a taste for agricultural pursuits, because they will see that labor guided by science is fruitful in useful results. Such a course of instruction will offer to those who shall distinguish themselves a station in society as honorable as it is lucrative, and will be regarded equivalent to a collegiate education, in harmony with the spirit of our institutions, the importance of which will be more and more felt, in proportion to the growth of the mighty west, which will receive new developments, when its political influence is better understood.

When we reflect upon the great interests of our country, we cannot but look with regret upon the neglected condition of our agriculture. For some years past, this all-important branch of industry has experienced serious obstacles, not only from being viewed by many as a degraded occupation, but from the want of attention and intelligence in the great body of our population. We have in our country numerous young men who have ample means for entering largely into this branch of business, but who are too little enlightened in regard to its nature, and refrain from industry, and suffer their capital, even with great losses, to remain dormant. We have others, too, who are without capital, and have a remarkable tendency towards the study of the practical sciences, of which we all feel the need in our actual or our future occupations. The latter class of young men would be incalculably benefitted by this course of education, and might be usefully and profitably employed as civil engineers, as directors of establishments, as well as teachers and professors in our colleges and schools.

In order that agricultural industry may develop itself throughout our country, it is necessary that our practical studies should enter into our manners; and this to such a degree, that each capitalist may find, either in himself or around him, able counsel. We should break down the barrier to every species of industry, and by leaving every man to enjoy the fruits of his own labour, undiminished by the exaction of a rapacious government. Let these principles be the immovable basis of our political economy. Our commerce and our manufactures should be defended and cherished like the sacred soil of our Republic. With means so ample and unembarrassed, we should give more enterprise and extension to works of domestic improvement. A taste for agricultural pursuits should be inspired, and new impulse given to public spirit. Institutions should be established, which, by assimilating the feelings of our citizens, may strengthen that union which is the bulwark of our national independence. Already the influence of our character far exceeds that of our strength, and our claims to the rank of a primary power, are admitted by the whole world, whose attention daily becomes more and more fixed upon our conduct. A great example is wanted by mankind—from us they demand it—and the cause of universal liberty is interwoven in our actions.

I have the honor to be, very respectfully, your devoted servant.
D. JAY BROWNE.

## Gauge Wheel for the Plough and Ruta Bagas for Hogs.

J. BUEL, Esq.—Dear Sir,—In your April No. of the Cultivator I noticed an article captioned "Help one another," and I can think of no way that I can better help my fellow husbandmen than by recommending to general use the gauge wheel on the plough.

Good ploughing I consider the first requisite in good husbandry, and yet many perform that part of their labor in a very slovenly, imperfect manner.

The article above mentioned, I view as a very important addition to the plough. The wheel should be 8 inches in diameter, and may be made from a plank 3 or 3 1-2 inches thick, with a bevel from near the centre to the outside, reducing the thickness to 2 inches. The tire may be made of common band iron. Bore an inch hole in the centre, place in it a box, reducing the hole to half an inch, which is to receive a bolt on which it revolves. The wheel is confined in iron bars or braces, one on each side of the wheel and beam. The braces should be placed in perpendicular form from the wheel to the beam, a little back of the clevey, through each of which should be three or four holes, and fastened to the beam with a bolt passing through it, with a screw and nut, with a handle, so that it may be easily altered, according to the depth you wish to plough, and from the

wheel backwards, angling, to meet the beam a little forward of where the coulter should be put on, and fastened the same as the other ends. They should be 1-4 or 3-8 of an inch thick and one inch wide, so that it may be used among stumps or firm stone without danger.

The advantages of the gauge wheel are numerous. Any one who has ploughed old land in a natural and uneven state without it, knows that it is very difficult to turn the land evenly, all over. With it, it can be done with perfect ease. By having the chain good length, you can enter all the hollows and turn the furrow well on the knolls; whereas, without it, the plough will invariably run so deep on the knolls as to leave the furrow edgewise, and ten to one it will turn back after you. Also, in ploughing where you ascend and descend, it is very beneficial, as the plough will run no deeper down than up hill; and if you wish to plough with three horses abreast, it keeps the heft of the whiffletrees and traces from urging the plough too much onto the point; and while I am here, let me just state, for the benefit of those who may wish to plough with three horses, that you can have a plough built with a play of one inch in the mortice of the beam through which the handle is put, which fill with a wedge, that when on one side of the handle will give it land enough for a single or common team, and when on the other none too much for three horses abreast. But to return. The gauge wheel is of great benefit when you wish to use four horses, as the forward pair can draw direct on a line from the end of the beam without affecting the running of the plough. Finally, it makes it much easier for any team, easier for the man that holds, and does the work far better. The whole expense does not exceed $2, and the only wear is on the bolt and box in the centre of the wheel. My neighbors who have used mine have each one of their own. "To try it is to be convinced." Therefore, to every farmer I would say, get you a gauge wheel.

With regard to ruta bagas for hogs, I would barely say, that I kept my store hogs, ten in number, entirely on them, raw, for more than two months in the last winter, of which I raised some with good success the last season. One and a half bushels per day kept them well. They would weigh probably 150 lbs. each.

If you think the above worth your notice, you may do with it as you think proper, and I am content.

Your obd't serv't,
L. A. BEEBE.

*Lima, Livingston Co. 7th May*, 1838.

### New kind of Wheat.

SIR—Last summer I received from Portugal a sack of wheat, the nature of which you will see by the subjoined extract of the letter that accompanied it. I send you a small parcel that you may appropriate it as you may think best for the benefit of the public.

"*Lisbon, 11th April.*

"They have here a description of wheat which I think may answer your purpose, called Trigo Tremeg, or Trigo de sette somanas, for its being cut sometimes seven weeks after it is sown. It is only grown on the low marshy lands which are under water at the time of sowing the common wheat, or upon the higher lands, when the spring rains have been so violent as to wash the seed out of the ground, by no means an uncommon circumstance here. On the marsh lands it gives regularly a very fine crop; on the hills it is uncertain, for if the hot weather comes on rapidly it gets burnt up before it has strength to resist the sun; if it escapes that risk, it usually gives a more productive crop than the common wheat. It is usually sown in the beginning or middle of May, and reaped in the beginning of July."

Yours very obediently.
L. ASHBURNER.

*Stockbridge, Mass.*

[Mr. A. will please accept our thanks. We have distributed and sown the wheat, and will hereafter give the result.—*Con. Cult.*]

### Mode of disposing of loose Stones, &c.

*Plattekill, Ulster, 4th mo. 13th*, 1838.

As there is much valuable land in this section of our country rendered almost useless by the abundance of stones that cover the surface, it may be asked how I get rid of them? I answer, there is a lane across my farm which is not at all injured by being covered two or three feet with stones, and the same gravel that covers one foot of stones would cover three, provided the large ones are laid in the bottom and the small ones atop. The same remark will apply to roads, one or more of which is contiguous to almost every farm, and would be rendered better by filling the hollows with stones and taking earth from the hills to cover them.

After clearing my rough land of stones, from the many encomiums on the ruta baga contained in thy valuable paper, I am induced to believe that to be the most likely crop to pay the expense, but it wants manure to cultivate it successfully, and I want all my stable and barnyard manure on my corn field and meadow. Are there not other ways of accumulating a heap of manure sufficient for an acre or two of ruta bagas on a farm of 100 acres? Every cleanly woman uses a barrel or more of soap in a year, and makes much rily water, by cleansing her floors, which, with the soap suds, is thrown out near the kitchen door, and forms a stagnant pool. Its miasma is prejudicial to the health of the family, and the cleanliness of the wife is put to the blush by the slovenliness of her husband.

Now every house is, or should be, on higher ground than some contiguous part of the farm. I would suggest the plan of making an under drain from the house to some low spot, put a fence around it, and a shelter for hogs, which, during the summer, may as well be confined at night as to be in pasture; in this yard throw weeds from the garden, straw, swamp earth, and no disadvantage would result from mowing many a field of St. Johnswort and daisies when in blossom, and consigning the crop to this yard. Now, lest I should tire thy patience, I will write no more.

JESSE BUEL. S. HEATON.

### A good suggestion.

*Wheatland, April* 25, 1838.

DEAR SIR—I was highly gratified on seeing the proceedings of the State Agricultural Society and Convention. I think the appointing of committees to report on the various items of husbandry is an excellent plan, and if continued, cannot fail of being very useful, and if there were two or three committees to report on each of the most important subjects, it would be better, as there is difference of opinion and practice on the most of them. We could then compare them, and be better able to judge which was right. Being some time ago in conversation with an intelligent gentleman, (who takes great interest in agriculture,) on the best plan for its advancement, he suggested the employment of a competent person to visit the various sections of the country and spend a day or two in each neighborhood, and thus ascertain what each are doing, and wherein they are deficient, and give it to the public through the medium of our agricultural journals, *without giving individual's names.*

I thought that the plan would be an excellent one; if performed by a competent person, it would elicit volumes of useful information.

April thus far has been very cold, with severe frosty nights, which has very much injured wheat on most ground, but dry soils as yet stand it well, which proves the great advantage it is to the cultivator to *ridge* and screen the ground so as to keep it dry.

WM. GARBUTT.

REMARK—The suggestion of our esteemed correspondent is a good one, and is virtually recommending an agricultural survey of the State—by which a knowledge of the best practices of every district, and of every good farmer, may be made known to, and adopted by, every farmer in the state who is desirous of improving his condition. There is no doubt but this important subject will engage the attention of our legislature,—*as soon as personal and political matters will permit them to attend to those of a primary and public nature.* As agriculture is of no party, she cannot expect her interests to have precedence of those which promise personal or political aggrandizement.—*Conductor.*

### Mineral Manures.

Although there is much to please and interest the mind in practical farming, yet devoid and apart from the theory, it is little else than a routine, suited to the capacity and ambition of uncultivated minds. An active and enlightened mind seeks to understand the cause and effect—to apply the sciences; in short, it is restive, until the queries embraced in agriculture, are disposed of and determined upon sound philosophical principles. 'Tis this constitutes theory! and 'tis this theory, that unfolds a world of beauties to the scientific agriculturist, of which the mere prejudiced practical farmer, the mere tyro and novitiate, must remain ignorant, and that too, of the highest branch of the profession which he follows.

The improvement which has been effected within the last twenty years in several of the eastern counties of Pennsylvania, (and *especially* in Chester,) is almost incredible. And the whole is mainly attributed to a regular and judicious use of lime as a manure. To me, it has been matter of astonishment, to find this inestimable restorative meet with so little favor in the minds of the conductor and correspondents of the Cultivator. My farm is situated in a district of secondary formation, and the soil is principally calcareous, yet I have seen the most surprising beneficial effects attending the free use of lime and plaster; the latter apparently reacting on the former, and consequently, the greatest benefit is derived by using them together. The crops, not only on my own farm, but on others in this vicinity, have been doubled by a free use of mineral manures. When a farm has been improved so as to produce heavy crops, there will be such a corresponding increase in the quantity of stable manure as to insure its future fertility.—I look upon the immense beds of limestone in this region as an inexhaustible store, designed by the [illegible] Governor of the World to keep up the strength of the land, in all time to come. I regard the limestone of Pennsylvania as a mineral, which will confer more real benefit upon posterity than any of her other mineral treasures. The aid which it promises to contribute to the support and improvement of her agriculture cannot be easily overrated. Some idea may be formed of the estimation in which lime is held here as a manure, by the fact, that farmers come from 25 to 30 miles, i. e. from Maryland and the poor district of primitive formation in the southern part of Chester county, bordering on the Maryland line, to my lime-kiln and others in the neighborhood: the lime costing those farmers twenty-five cents per bushel when delivered. To the farmers in that quarter, lime is the "anchor of hope;" *there* it has already made the barren and desert place *glad*, and is fast putting a new and improved face upon the country. The farmers, *even there*, with this far fetched means of improving their land, prefer bettering their condition by liming near a good market, rather than migrate to the exuberant soil, and realize the utopian dreams and fairy tales of the "far west."

On part of my farm, 300 bushels of lime per acre have been applied within 30 years, at the rate of about 100 bushels per acre at a dressing, and always put on fresh, and slaked, then immediately spread. I am not inclined to believe that lime should become carbonated before it is applied. I adopt Sir Humphrey Davy for my prototype, in every case involving agricultural chemistry. I shall be encouraged so to do, until some modern wiseacre can clearly demonstrate that Sir H. is wrong. Doubtful points in Davy's theory have become demonstrable truths with me, after being aided and enlightened by the lamp of experience. Lime, in its fresh caustic state *only*, while an alkali, acts as a decomposing agent in the soil, rendering vegetable substances soluble—but when a mild carbonate, it operates only like marl, in improving the texture of the soil, according to Davy, whose authority is unquestionable, and the theory, at all events, may fairly challenge contradiction; hence the advantage of applying lime, like stable manure, in its fresh state.

With regard to the theory, or the manner, in which gypsum operates on vegetation, an accidental circumstance which occurred in my practice and under my own eye, goes further to establish the truth in my mind, than all the ink that has been spilled on the subject; even the adopted theory of Prof. Low and British Husbandry to the contrary notwithstanding. In April, 1832, I sowed a ½ bushel of plaster on a small piece of land in the middle of a wheat field, for experiment,—in order to ascertain whether the plaster would have the slightest effect, even of changing the color of the wheat,—the result answered my expectations; there was not a shade of change in the color of the wheat in the future stages of its growth. In autumn following, the same field was again ploughed for wheat, and the plaster of course turned down, the field was deeply ploughed, say seven or eight inches—the spring following the field was sown with clover seed; the secret *then* was speedily developed; when the wheat was cut in harvest the growth of clover on that same land which had been sown with plaster was so luxuriant as to interfere with the cradle in cutting the wheat. Soon after harvest, the clover on the said land flowered, and a heavy swarth might have been mown on it in September following. The adjacent parts of the field, with the same soil and culture, exhibited a sickly contrast. In the autumn of 1833, the clover on said land was trodden down by stock, returning manure to the soil, and by that means the plaster *indirectly* prepared the ground for a sure crop of wheat.—This one single and simple fact, serves to overthrow the theory that plaster must be sown on the plants, to be absorbed through the pores of the leaves—attract moisture from the atmosphere, &c. This mooted point I consider settled, and the soil and roots made the laboratory instead of the leaves and the atmosphere.

Although my agricultural career has been only short, yet the great object, *improvement*, has been ardently and zealously pursued—sufficiently, indeed, to create a most utter and implacable abhorrence against all vague and unfounded theory, which is the bane of the agricultural press. The mere conjecture of a writer, if in error, will do no harm; but 'tis the *positive* declaratory assertions, where wrong, that do mischief, inasmuch as many believe and adopt what they read.

*Quere.* Why is it that lime and plaster act much more efficiently when both are applied to the soil, since the base of *both* is lime?

WM. PENN KINSER.

*Springlawn Farm, Pequea, Lan. Co. Pa. April* 25, 1838.

### Planting Corn and Potatoes.

Mark out the field (large or small,) one way two and a half feet apart, then plant two of these rows with potatoes, and two with corn, alternately. Both corn and potatoes to be planted fifteen inches apart between the plants or hills. Plough among the plants only one way, or any other process of horse hoeing in the same direction, not only cleaning and pulverising the soil, but laying up the earth to the potatoes, so that very little hand hoeing is necessary; and whatever the *produce* may be, the *number of plants or hills* is at least four, often five or six times, greater, than common planting by the acre. The philosophy of this mode of planting is, that the potatoes do not shade the corn any, and every row of corn is an outside one, so that it has light and air in abundance, and the potatoes are not hurt by the partial shade of the corn. I am a Scotch farmer.

J. BUEL. WM. SMALL.

### A too Common Case.

*New-Scotland, April* 18, 1838.

Mr. J. BUEL,—Sir,—Having been a constant reader of your valuable paper, the Cultivator, since its first publication, I have invariably found you quite anxious to better the condition of the agricultural community generally. We New-Scotland farmers, many of us, are like the man who held the six-pence so close as not to see a dollar at arm's length. Our practice is as follows: if the land be nearly exhausted, to plough and sow the more, to obtain the greatest possible quantity of grain for market as soon as possible—to take crop after crop of small grain, and apply no manure, (except perhaps plaster) as long as a medium crop can be obtained—to reduce the stock in proportion to the quantity of hay and grain that may be on hand at the setting in of winter. The consequence is, a diminution of the quantity of manure, the stock so sparingly fed as to be quite un-

profitable, and the farmer discouraged. You are no doubt ready to denounce these practices as bad, yet there are two causes, (and perhaps more) which go to confirm them; the customs of our fore fathers, having forgot that it has fallen to our lot to renovate a worn out soil, and the want of sufficient capital. With regard to my own practice, I must confess, I am robbing my land of its just due every year for the want of capital. Every ton of hay and straw, and every bushel of grain which I raise, should be consumed on the farm for ten years to come, at least. I am of opinion that had I kept all my produce of last year, ground the grain, and chopped the hay and straw, I could have kept twice the stock, and this rule may be applied to all my neighbors.

With regard to the foregoing remarks there are perhaps some exceptions, yet they apply to New-Scotland too generally. It is evident, then, our condition, as farmers, needs to be bettered, and if you think we need skill more than capital, (as we know you can impart it,) we shall look to the pages of the Cultivator.

W. M.

### To relieve choaked Cattle.

*Agawam, Hampden Co. Mass. April 24th,* 1838.

JUDGE BUEL,—Dear sir,—Observing in your valuable paper several communications on relieving choaked cattle, I take the liberty to state a case that came under my observation, which was as novel to me as it was efficacious. A neighbor of mine called on me one morning, a few years since, to assist him in relieving an ox of his that was choaked some time during the night, in consequence of breaking into an orchard; the ox was much bloated and in great distress, and it appeared he could not live many minutes. While making active preparations to relieve him, an elderly lady belonging to the family emptied part of the contents of a small snuff box into her hand and applied it to the nose of the ox; the relief was almost instantaneous, the bloat rapidly diminished, and the ox five minutes after ate some hay laid before him. I never heard of the remedy before, nor have I known it tried since, but in that case it was effectual.

Yours respectfully,
JONA. E. FERRE.

### Plants exhaust moisture.

Judge BUEL,—Sir,—In Mr. D. Tomlinson's communication in Cultivator, No. 2, vol. 5, on sowing grain early and feeding it off, he presents one idea, which I think is an error, and has a bad tendency. He recommends sowing grain early, (so do I these cold seasons,) so that it *"should come forward, shade and protect the ground from becoming too dry by early drought."* I suppose, from your remarks, which follow, that you either did not notice the above quotation, or else you are of the same opinion, that ground covered with vegetables will not become as dry in a drought, as it would if it lay naked. If vegetables do protect the ground from drought, then we cannot differ from our neighbor, who, in a dry time, remarks, that he shall not hoe his corn and turnips until it rains; he wants the weeds to shade the ground and keep it moist, or *"shade and protect the ground from drought."* As many farmers suppose that the shade of trees and vegetables keep the ground from becoming as dry, in a dry time, as the naked ground, I would mention that experiments, as well as reason, has satisfied me to the contrary.* I have found, by digging where the ground was equally loose or mellow, in a naked summer fallow, and corn field, where the corn nearly shaded the whole ground, in a very dry time, in August, that the ground in the latter, was at least a hundred per cent the dryest. The reason for this is so obvious, that it needs no explanation from me, and I offer none, unless called for. If Mr. Tomlinson should *"engage again in farming,"* and examines his grounds in a drought, to find where they are the dryest, I think he will find it to be in his upland meadows, or under the shade of a tree in his meadow, (I mean to except roads and other hard trod ground,) if it is a little before haying.

Yours respectfully,
WM. BURNHAM.

*Madison, April 28,* 1838.

* Mr. Burnham is correct.—*Con. Cult.*

### Force of Habit.

*Chillicothe, Ohio, April* 11, 1838.

J. BUEL, Esq.—Sir,—The soil in this Scioto valley is naturally so rich, that our farmers have heretofore considered that there was nothing more necessary on their part to ensure a crop than merely to put in the seed, and bestow upon it a small amount of *rough* working. But we find, tho' the country is but about forty years old, this mode of culture has been such a continual draw upon the native strength of the soil, that manifest symptoms of exhaustion appear. This is causing some farmers to think upon the necessity of altering their mode of culture, and seeking for new lights upon the subject. But this waking up to a consideration of their true interest and that of the country, is not general among our farmers; there is but here and there one who has been brought to think upon the subject; hence the small number of subscribers to your valuable paper, and the scattering manner in which they are sent you.

It is a hard thing to break through ancient prejudices and habits. You ask a Scioto grazier how much corn it costs him to fatten an ox—he will tell you from 75 to 80 bushels. You question the necessity of expending that quantity upon an animal, and his economy in feeding, he will say to you, I have been engaged in feeding cattle for more than 30 years, and can be taught nothing respecting the business. To another, who practises no rotation of crops,—you say to him,—by taking off a crop of corn from your land year after year, burning the stocks, and neglecting to put any manure upon it, you will exhaust the soil and impoverish your land. He will reply, "I am an old corn raiser, and perfectly understand the making of that crop."

Light must be let into such minds by degrees; and I know nothing better calculated to lead farmers to thinking upon the subject than reading the Cultivator.

Very respectfully, &c.
NATH. SAWYIER.

### On steeping seed Corn.

To prevent birds from pulling up or insects from destroying corn when planted, soak the corn 24 hours in a solution of salt petre and warm water; then, after draining off the water, take three parts tar to two parts of fish oil, warm, and mix them together, and put the mixture on the corn, stirring the corn until the mixture adheres to and covers the grains; after which it may be rolled in plaster, lime, or ashes, to prevent the grains sticking together when dropping. It is thought the tar prevents too much wet, after planting, from rotting the corn, and the oil prevents too much dry weather from drying the tar and thereby forming a crust around the grain that a sprout cannot get through, but both together make the mixture of a proper consistency that retains the moisture, renders the covering soft, and admits the sprout to get through. The above method has been tried a number of years by Mr. Ephraim Clark, a highly respectable farmer of Westfield, N. J., a number of whose neighbors also have tried the same with beneficial results, rarely having had to plant their corn over prepared in this way.

N. B. The same preparation answers well for Lima beans.

The above method was communicated to me by Mr. Ephraim Clark, who gave me permission to send it for publication.

Yours, &c.
WILLIAM MARSH.

*Rahway, April* 24, 1838.

### Tonawanta and Tuscarora Hogs.

*Tonawanta, 27th March,* 1838.

SIR,—I notice in the extra of this month, which has but just reached me, among matters both sage and interesting, the very excellent report of the State Agricultural committee on swine, in which I find that you honor our young town in the name of a *distinguished* breed of the grunting gentry. We take the affair quite as good humoredly as it is there represented, and can only regret the "non-accompaniment of the sketch terrorum," as a finish to the no less just than comical picture. We hope it may yet be found, and grace the columns of your admirable journal as an *eschewing* beau ideal, for all future pig breeders. I suspect, however, that when the said portrait does appear, it will find many a faithful original, not only in Tonawanta, but wherever the Cultivator may happen to circulate, be it in the forests of the north, the settled regions of the east and south, or the wild prairies of the west, and alike recognized, a wandering, squealing, grunting, raw-boned, thick-skinned herd of Ishmaelites—profitless to their owners and a nuisance to their neighbors, whose hand, or rather *snout*, is against every man, and against which every hand in the land should be indiscriminately raised.

Thus much in corroboration of the Tonawanties.—Allow me now to regret, that the committee had not extended their researches a little further in our good town. They would have then found, through the spirited exertions of a few individuals, another breed grown up among us, that I, at least, think the very perfection of swine, and that will prove to hogs, what the Durhams have to cattle, viz. combining in a very eminent degree the best qualities of all others. These also bear an aboriginal name, the noble sounding Tuscarora, and have been found mainly by a judicious crossing of the improved China with a very superior breed from Canada, and a slight touch of the Berkshire, giving them nearly the fineness of bone, the quietness and aptitude to fatten, together with the delicacy and sweetness of meat of the China, and a trifle more than the size, and an equal goodness of ham, of the Berkshire. They are beautifully spotted, of a clear black and white, the colors showing about equally,—are fine in the head, small ears, short legs, long, broad and deep bodied, and square lady sloped sterns, being in this last point, in my humble judgment, a very handsome contrast to the Berkshires.

The tenants of the Hon. Stephen White and A. B. Allen, Esq., rear them in the greatest perfection, but thus far have been rather chary in offering them for sale, preferring first to tolerably perfect the breed. Mr. Allen now proposes to part with boar pigs. He has also a stock of the improved China and Berkshires, so that gentlemen addressing him may be sure of a choice in the only breeds that are really worth cultivating, and I will venture to say as fine animals as can be imported or found in any other part of the country.

Thus, sir, having taken up the cudgel in an amateur whirl on behalf of the productions of our flourishing young town, and, as I hope, done the numerous readers of the Cultivator some service, in introducing to them, for the improvement of their own stock, a new variety of the honorable, grunting fraternity.

I remain, very respectfully, your ob't serv't. A.

*P. S. 6th April.* Since writing the above, I have had a look at the Cultivator of this month, in which I see a real racer, mounted over a fat Berkshire. He certainly is a *caution*, as we say here in the west, and gave us many a hearty guffaw. Pray, sir, is this the "Tonawanta sketch?" If not, let us have it, as I think our varied breeders here can match you for any thing pictured, be it *fat* or *lean*.

### Reclaiming Swamp Land.

*Glassboro, N. J. April* 24, 1838.

DEAR SIR—With your permission I will avail myself of the present opportunity to thank you for the suggestions contained in the March No. of the Cultivator, in reply to my queries respecting the improvement of my worn out lands. If it will not tax your patience too far, I will again call your attention to this *to me* most interesting matter. My experiment with the ruta baga has been most satisfactory. My milch cows, fed upon nothing but very indifferent hay, with a half bushel of turnips cut tolerably fine a piece, given twice a day, make butter, which, for color and flavor, I think, will not suffer in comparison with that made from the best clover pasture—while their appearance is so sleek, notwithstanding their having been exposed, without any kind of shelter, to all the storms of the past winter, that the question has been asked by others, have they not been fed on grain? This season, I am going to try to raise double the amount I did last.

But the matter I had more particularly in view when I commenced this, was to ask your advice in regard to reclaiming a piece of branch meadow, containing about twenty acres, situated on a part of my premises. This meadow lies at the head of Prince Maurice's river,—once part of an extensive swamp—and has at this time a soil about six feet in depth, composed of alluvial deposit. Twenty-five years ago this, with the rest of my farm, was in a fine state of cultivation, producing heavy crops of valuable grass. But it is now a waste, covered with a solid mat of moss, partly overgrown with bushes, with scarcely a spear of fine grass throughout its whole extent. Its only ditch is cut nearly through the middle, following the serpentine course of the original stream; the whole is now wet and miry. The bushes I know what to do with—but how am I to get clear of this infamous moss, which now holds such entire possession? What plan shall I pursue in draining it? And when reclaimed, how is it to be got into grass? Any information respecting the above, will be gratefully received by

Yours, E. C.

REMARK.—Water—excess of water—is the undoubted cause of infertility. It probably comes from the higher grounds, and has to pass to the central ditch for an outlet. If our correspondent will ascertain its source, and conduct it off before it saturates his six feet soil, and will clear off the moss and bushes, and stock it with grass seeds, there is no doubt but it will again produce valuable crops of grass. Let a good under drain be made upon the borders adjoining higher grounds, to catch the water and lead it into the main drain; and if the wetness continues, make lateral drains, and if the water comes from spouts or springs on the flat, the source of the evil must be sought out, and the remedy, a drain from it, applied. Make the main drain straight, at least four feet broad at the surface, and three to six feet deep.—*Cond.*

### Agricultural Books—Ruta Baga.

*Unionville, April 7th,* 1838.

J. BUEL, Esq.—Dear Sir—Permit me to avail myself of this opportunity to convey to you my own and the thanks of our Agricultural Society for your kind assistance to me in procuring books for our library when in Albany in 1836. We should be glad to see in the Cultivator a notice, from time to time, of such publications as you would consider a valuable addition to an agricultural library.* We are adding some few volumes to our library, as we have opportunity, but we find it very difficult to procure suitable books to any extent for such a library, and still more difficult to get farmers to read them when procured.—Nothing that has ever been introduced into our agricultural society here has met with more opposition than the introduction of agricultural books and periodicals, and it is only within these two years past that the one or two persons that have advocated it these eight years past could get a majority to consent to it at all; and we believe that the same amount of money has never been expended by the society in a way to produce as much lasting benefit to the community; and the managing committee of our society, which is now called the District of Johnston Agricultural Society, have become so far sensible of this, that they have determined still farther to increase the means of information, by placing in the hands of each member of their society, (that pay two dollars a year or upwards,) a monthly agricultural paper gratis, and it is in furtherance of that determination that I am authorized by them to make the above order. We have ordered papers from other places, and the probability is, that we may be under the necessity of troubling you with further orders before the termination of the year. Since we have adopted the plan of diffusing the means of information, we find it far easier to get

* We are not aware of any recent publications on American husbandry, except our agricultural periodicals. If Chaptal's Agricultural Chemistry, Low's Elements of Practical Agriculture, and the Farmers' Series, published by the British Society for the promotion of useful knowledge, were not included in our former list, we can recommend them as valuable acquisitions to an agricultural, or farmers' library.

farmers to introduce new plans of improvement in their agricultural operations. Notwithstanding the slowness of our progress in the scale of agricultural improvements, in comparison with what is being done in some parts of Europe and the United States, yet it ought to be matter of some encouragement to us, that by making a seven years comparison we can discover that we have progressed a little. Our Society was formed in 1830, and as was usual at public meetings at that time, the brandy and wine bottle was brought in abundant requisition, and after the close of business, the meeting was broke up in dispute and disorder. But clear cold water has now taken the place of the brandy and wine bottles at our agricultural meeting dinners, and generally supersedes the use of whiskey in the field; and we expect for the future to bring clearer heads and sounder understandings to our assistance in hastening mental and agricultural improvements. Six years ago an attempt was made by the managing committee to introduce the culture of the ruta baga, by offering a small premium to any one who would cultivate a quarter acre, but not an individual could be induced to make the trial. But last year a number of pieces came in competition, and received premiums. My own received the first, and yielded at the rate of about six to seven hundred bushels per acre, and this year there is a prospect of considerable being cultivated, if seed can be obtained. Mangold wurtzel would receive a trial also, if we could get seed.

J. G. BOOTH.

### Economy of Manures.

*Hagerstown, April 25th, 1838.*

To Jesse Buel, Esq.—Dear Sir—* * * In speaking of 40 loads of manure to the acre for corn, does Agricola mean cart or wagon loads? I find a much smaller number of wagon loads of long manure from my farm yards, (so constructed as to retain all the *lye*, and the manure completely saturated with the lye,) a handsome dressing for corn. On the subject of manure, I will observe, that my system is, to carry out from my farm yard two crops a year. The first crop is made chiefly from straw, during the fall and winter, and carried out in March, for my corn crop. I then, immediately, commence feeding my corn stock fodder, brought in and stacked near the farm yard, so as to be fed and littered away in my farm yard, where my cattle and horses are kept until the middle of May, or the crop of fodder is consumed. By keeping my cattle up in this way until late in May, I find their manure, mixed with the corn stalks, produces fermentation and decomposition by the middle or last of August, so as to enable me to use the manure to great advantage on my fallow fields as a top dressing, to be harrowed in with the seed wheat. This year I shall keep my cattle, &c. in my farm yard after they have consumed the corn fodder, and feed them on clover, cut and brought into the farm yard and fed from racks. This, I think, will greatly enhance the value of the manure, expedite fermentation, and tend greatly to decompose the corn-stalks. My corn field will be an old clover field, mixed, I regret to add, with too great a quantity of wire or blue grass, (to get rid of which I wish you to instruct me.) The sod is turned under, deep, in the fall. In the spring, the spring crop of long manure is applied, and the ground cross ploughed, throwing the long manure below, and the sod turned under the last fall, a great portion of it is brought to the surface, which, by the use, then, of a heavy harrow, twice applied, is well mixed with the soil, and my land, I find, in good condition; and by the use of the Cultivator, frequently used during the summer, my crop of corn will be productive, and the land put in fine tilth for small grain. I have been surprised to find the sod turned under the preceding fall, on being brought to the surface and exposed in the spring, easily pulverized and incorporated with the soil, and so decomposed as to furnish, I would suppose, fine pabulum for the young corn.

The above remarks, hastily thrown together at a leisure moment, are intended to elicit your opinion. A short letter in reply, (or full on every subject, if you can spare the time,) will be esteemed a favor.

I am, sir, very respectfully, your ob't serv't,

F. TILGHMAN.

Remarks.—We are inclined to think that cross ploughing for corn both wastes the fertilizing matter of the sod, and encourages the growth of blue grass. We venture to suggest, that the spreading of the spring crop of long manure in the spring upon the clover ley, and *then* ploughing it under well *once*, would be a preferable course. If the sod is found to decompose in the winter months, it will do so much more readily in the spring, particularly if aided by the leaven of long manure. Mr. T. will find his queries, in regard to preserving corn, and to what constitutes a load of manure, in a measure anticipated in other columns of this paper.—*Cond.*

### To the Dairy Women of our Country.

*New-York, April 25th, 1838.*

The undersigned, dealers in butter and cheese, would call the attention of the manufacturers of these articles in the middle and western part of this state, to the existence of general and just complaints in regard to the quality and condition of both butter and cheese made in such sections, together with the packages. In view of this fact, and to encourage an improvement that will restore and increase the reputation formerly enjoyed by producers of these articles, they would respectfully submit to their consideration, the following views, relative first to the manufacture of cheese:—In all cases, the milk and rennet should be perfectly sweet; as much of the animal heat should be evaporated from the milk as time will admit; when the curd is properly produced, break it up very fine, cook it well, but do not heat it so much as to start the oil in the curd; season it with clean fine salt, pure from lime; put the cheese in the press cool; press it hard, in order to extract all the whey from the middle before the outside closes tight; continue to press for two days; from the press put a dry cloth over it for a few hours, until a rhind is formed—then put on Annatto, dissolved in strong lye; cover again with cloth until next day; after the cloth is removed, put on a thick strong coat of melted bees-wax and lard, or butter; get a bright smooth surface, and keep one, by constant rubbing and turning, until the cheese is perfectly cured. When put in the casks, let it always be done in cool dry weather. All cheese should be slightly colored with Annatto in the milk, and such as do not exceed fifty pounds in weight, should be made a bright orange color—cheese of this description being generally in good demand for the southern markets. Finally, there should never be any late cheese. In no case should cheese be sent to market made after the 15th day of September, nor should it be sent even thus late, unless the utmost pains is taken with it, and unless well cured by a fire. It is of the greatest importance to the dairying interest, that these rules, in regard to late cheese, be strictly conformed to: for this kind of cheese not only destroys itself and greatly injures the market for a good article at the present time, but should the practice of making and sending it be persisted in, it will eventually destroy the business. To prevent any loss to the farmer, the undersigned would advise them to make butter after the 15th of September. Butter made after this time always commanding a fair price.

2nd. Of cheese casks.—They should be smoothly and well made of good seasoned wood, not less than half an inch in thickness for small casks, and five-eighths of an inch for large casks: the heads of all large casks should be at least five-eighths of an inch in thickness, to prevent them from springing; the staves should be narrow, in order to preserve their places and keep the cask round; there should be always a fair bilge, with at least eight good substantial hoops, (maple hoops should never be used,); the quarter hoops should never be put down so low on the casks as to allow the staves to spring out when the head hoops are taken off; the other hoops should all be securely nailed.

3rd. Of butter.—In all cases where it is made from cream, it should be churned before the delicious flavor is lost, or any bad flavor is induced; avoid too much heat in the process,* as this causes the butter to be soft, and of fine grain, bordering on a waxy character; never fail to extract every particle of milk before it is laid down; season it with rectified fine salt, or ground solar salt, and work in no more of it than will be entirely dissolved—where any of it is left undissolved, it destroys that delicate rosy flavor which renders the article most desirable, and its value diminishes in proportion to the excess of salt—this being one of the greatest objections to western butter.

4th. Of the packages.—The undersigned would recommend two kinds, viz. firkins and Welch tubs.—The firkins should be made of seasoned white oak and walnut hoops. Where white oak is not to be had, they should be made of heart stuff of white ash, and hoops of white or black ash, or elm, of good shape, and perfectly smooth; have on at least ten good hoops, smoothly shaved; be perfectly tight, and contain 100 lbs. Welch tubs should be made of seasoned white ash, hooped with seven substantial split ash hoops, smoothly shaved, to contain 100 to 120 lbs. Both firkins and tubs should be soaked with a strong pickle, in order to saturate the wood before the butter is laid down, (but never put any salt at the bottom or on the top of the butter.) Great care should be taken to put it down solid; never fill the packages so full as to have the head or cover touch the butter, and always make a smooth surface on the top with the ladle. The tubs and firkins should be weighed, and the actual dry weight marked upon them with a marking iron in such a manner as not to be obliterated; and let them always be found accurate.

In conclusion the undersigned give it as their decided opinion, that the manufacturers of cheese and butter in the middle and western parts of this state, who will observe the above rules, and unite with the observvance a desire to make their articles of the first quality, after a little experience, will soon be able to compete with any part of the United States, both in quality and prices, at home or abroad. Possessing, as these manufacturers undoubtedly do,—one of the finest soils, and best adapted to grazing of any in our country, they may produce the article in the greatest perfection. On this, as well as other accounts, the undersigned wish to impress upon their minds the importance of this subject, and that the course recommended is the only one which will secure to them the advantages of a fair price and good reputation for their labor and pains.

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|---|---|
| Leggett & Lapham, | Robert Nisbet, |
| Nathaniel Gordon, | Seth Miller, |
| Wm. H. Davenport, | Cook & Gage, |
| Burrell, Perry & Co. | Varnum S. Kinyou, |
| John Johnson's, Son, | John P. Snell, |
| Gregory & Brown, | Curtis Easton & Co. |
| Walter Sutherland, | Nisbet & Husted, |
| Eleazer Mills, | Henry W. French, |
| P. Pidgeon, Broker, | Charles Stanton, |
| Abbey & Atwood, | Solomon Petree, |
| A. B. Meech & Co. | John J. Owens, |
| Smith, Howe & Palmer, | Ashley Devenport, |
| Stickney & Dean, | A. H. Buel, |
| Gove & Brown, | Henry Carter, |
| Charles F. Joy, | Chas. Stokes. |

* It has been found, that the *best* and *most* butter is obtained when the cream is about the temperature of 55°—and if the temperature is over 60°, the quality is inferior, and the quantity diminished. Hence, every dairy should have a thermometer.—*Conductor Cult.*

### On Steeping Seed Grain.

*Ionia County Seat, Mich. April, 1838.*

Sir—Having recently become a patron to your excellent and very useful paper, and in the last volume finding several communications upon the subject of steeping seed corn, from persons who have been unsuccessful and are adverse to the practice, I feel disposed to offer a little of my experience in its favor.

It is now some twenty years or more since I first inherited the practice (from my elder brother,) of steeping seed corn in a solution, of sal nitre, and have ever derived manifest benefit therefrom. One object of this communication is to relate the effects of this practice on a particular occasion, which, however incredible it may appear to some, is not the less true. Another is to encourage those unsuccessful steepers to try again and again—try on. In the spring of 1826, I planted twelve acres of corn on a green sward recently turned over; harrowed and the rows marked out, and as usual put my seed a steeping the evening previous to the commencing the operation of planting. Repeated experience had proven to me that if the planting was accomplished before the cold easterly storm commences, which visits our country between the 5th and 20th May usually, my corn was more thrifty, would better endure a drought, and be beyond the effects of early frosts; while the older farmers in my neighborhood, who waited for that storm to pass by, were sure to have a poor crop, when that storm was late, or a drought followed, as was sometimes the case. On this occasion the storm came on in the midst of the planting, and drove the men from their labor. The seed in a tub was brought home and put in the carriage-house, and in hopes the storm would pass off in a day or so, the liquid was not poured off, but remained with the seed until the germs had grown a quarter or three-eights of an inch; in this state the seed was emptied upon a piece of very coarse sacking, the corners of which were pursed over a hoop and fastened, and hung up to drain, where it remained for some days until the storm was over, when the planting was recommenced with this sprouted seed, the germs of the corn having become wilted somewhat and thereby toughened, so that they would not break off, readily satisfied me that the seed would grow; the planters being faithless, thought to improve the matter by putting in five and six kernels to the hill, instead of three or four, as I had directed; the first consequence of which was, that the seed was all used up before finishing the ground, when I knew there was an abundance. This was, however, kept secret from me until the corn told the tale, and I was obliged to pull up at least one-third of the corn so planted, and showing satisfactorily that the seed all came up.

My invariable mode in preparing the seed was to put the nitre into boiling water, that it might the more readily dissolve. As to quantity I was never precise, but as we Yankees would say, "guessed at it."—When the nitre was all dissolved, and I could bear my hand in the solution, I poured it upon the corn, and if there was not sufficient water to more than cover the seed, added more warm water, otherwise the swelling of the seed would soon cause a portion of it to be out of the water.

Should you deem this communication useful in what I esteem the very excellent practice of seed steeping, you are at liberty to make such use of it as may seem proper. Very respectfully, sir, your obd't servant,

J. Buel, Esq. TRYON.

### Deep Ploughing—Steam Engines—Wisconsin.

*Buffalo, April* 12, 1838.

My Dear Sir—Under the head of "good tillage," in your last number of the Cultivator, you have thrown out some most valuable suggestions as to the mode of ploughing. Your recommendation of *deep ploughing* is one that I have thought for some time, should be made a subject of special attention by agricultural papers, and *insisted on*, as the *great augmenter of nutriment for vegetables*. By breaking up the hard, compact earth, which sustains the vegetable mould, and disintegrating this indurated mass, the atmosphere, and rains, and dews, have access to portions of earth hitherto beyond its reach, and as you have conclusively shown, rapidly fertilize and render it capable of sustaining vegetable life. This increase of the *pabulum* of vegetables by the difference of the *mode* of culture, without addition of expense for *material*, and scarcely any of labor, seems akin to that of increasing the food of animals by steaming simply; the first makes *two* blades of grass grown where only one grew before, and the last makes each blade go twice as far; the result of the combined improvement of deep ploughing and steaming, giving as four for one over the common methods. These topics should be insisted on strongly and constantly, and whenever adopted generally through the country, farming will become what it really is, and ever ought to have been considered, not only the *first* and *noblest*, but the *most profitable* occupation of man.

This subject acquires great additional interest when applied to our western soil. With us, and throughout the great west, nearly all, (I think I speak within bounds in asserting seven-eighths at least,) of the land in the west, is what is called *clay*, having a clay sub-soil, with a large share of this earth intermixed with the super-soil. This is eminently the kind to be most improved by deep ploughing. This earth is so adhesive that it forms a perfectly solid mass, impermeable to water and the atmosphere in the slightest degree, and while remaining in this state, incapable of furnishing the least sustenance to vegetables. Yet this same sterile material, so worthless in its natural condition, becomes by proper cultivation, the most fertile and valuable, capable of producing, with proper additions of coarse manures, every variety of crop in the greatest luxuriance. *Deep ploughing* is the first and essential requisite for this, and now sir, how are we to apply the remedy? We have no plough that is at all suited to this object. "Smith's sub-soil plough" referred to, we have no description of, and know not where to obtain, till you, sir, do your subscribers the favor to direct them where they can be procured, or give a description so minute that any ingenious mechanic can make one. With this instrument, however, it seems to me a *steam propelling power* should be used, as the great additional labor to be done will require a considerable increase of power, which will render the application of steam peculiarly appropriate and desirable. Indeed from the great saving which steam would afford in this branch of husbandry, it is somewhat surprising we have not yet had even one successful *steam plough*. In the spring of '36, while travlling over the fertile praries of Wisconsin, I was struck with the perfect feasibility of the application of steam to ploughing, and of its great utility too, as I saw some eight or ten yoke of large cattle attached to an axletree, to which a plough was fastened, and this with no one to hold it, and only a single driver, was turning a furrow of almost interminable length, at a snail's pace, which it is almost impossible to quicken with oxen attached to a plough of any kind. There was nothing in this operation which was not perfectly mechanical, and coming within the scope of *machinery*, under competent management. For a large portion of the west, (with us as well as elsewhere, when the ground is clear of stumps,) and over all the level lands of the east, such as the large and fertile intervals of the Connecticut, in and about Northampton, where by a judicious municipal arrangement, fences are done away with, tracts of thousands of acres could be ploughed in a body by a single machine, at an expense of probably one-fourth the present cost of ploughing, and this too may be done with scarcely a perceptible increase of expense for any additional depth, and others by combining the two improvements, steam and deep ploughing, we obtain our great objects, *the fertilization of the soil and the large increase of vegetable product*, at an expense very much below that of the ordinary method.

Mr. Dutcher, of New-York, the successful competitor for the premium plough at the fair of the American Institute last fall, is experimenting on a steam apparatus, as I was informed when in the city last winter, but my search for his establishment was unsuccessful, and I know not what progress may have been made in perfecting one. It is to be hoped, however, it may not be deferred beyond the period absolutely required to complete it.

Allow me, sir, to suggest an idea or two which you can make of benefit to the community, though a little out of the path of *agriculture*. Cannot *steam* be used to a great extent in enlarging our canal by applying it to excavating machines, which will work perfectly well under water? I have used such a machine in some parts of our harbor, that with horse power would do the work at from six to eight cents the cubic yard. Could excavation be done as cheap even if the water were excluded?

In the long reaches of the canal, where locks were not interposed, could not a large saving be made by laying a slight rail-way on the tow-path for a locomotive, that could draw any number of boats attached to it, at twice the present speed, and perhaps one-tenth the present expense? Cannot some plan be devised of carrying off the smoke, cinders and steam, which are now the great annoyance of rail-road travelling? I believe it entirely practicable, by having large, stationary, horizontal pipes attached to the top of each car, to be connected when the cars are attached to each other, by *flexible* pipes, which can in a moment be joined, and through this continuous pipe the whole obnoxious effluvia from the locomotive would be delivered behind the train. In winter a pipe might form a part of the floor of the cars, and thus contribute essentially to the comfort of passengers. This alteration would allow of seats on the top, and thus enable travellers in pleasant weather to make a trip as agreeable as expeditious.

Can you inform me where any of the *genuine* Egyptian spring wheat can be obtained?

Excuse this discursive sheet; I should not have obtruded myself at this time on your attention, but for the purpose of requesting you to forward the *present* volume of the Cultivator to J. W. Conroe, P. M. Manitouwoc Rapids, Wisconsin Territory. We are beginning a fine settlement at and adjoining the mouth of the river in this fertile valley, which extends from Lake Michigan on the east to Lake Winnebago on the west, through which we hope eventually to have a navigation by the Fox and Wisconsin rivers, *now navigable* to the Mississippi; and this internal communication will be second to none other in importance in the west, combining timbered lands and prairie of unsurpassed fertility, copper and lead mines, pure water and a wholsome climate, soon to be filled with a dense, intelligent, active and thriving population, and *we want to begin this end of it right*, and know of no better method than to commence with your excellent publication and the Genesee Farmer. If your periodical suits the soil and climate, and I know of no objection to its answering for both, I think in five years you will have some thousands of subscribers in that territory alone.

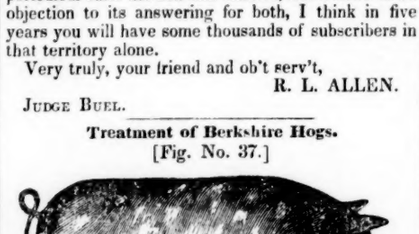
Very truly, your friend and ob't serv't,

R. L. ALLEN.

Judge Buel.

### Treatment of Berkshire Hogs.

[Fig. No. 37.]



Mr. Buel—Sir—It was my intention to have had the above cut, a portrait of one of my Berkshire sows, at the head of my communication in the last number of the Cultivator, but the absence of Mr. Pease, the engraver, prevented his finishing it in time; I therefore offer it now, and accompany it with some information which I have been called on for, regarding the feeding and management of breeding sows, &c. &c.

Swine are capable of propagation at eight or nine months of age, but to insure great size, and a stronger and better litter, it is advisable not to have them come in, until after they are one year old. The boar should be used sparingly until he is eighteen months of age. The period of gestation is about sixteen weeks, so that two litters may be easily produced in the year. I prefer the months of March and September, for my sows to litter, as the weather is generally milder and less risk in rearing.

The usual produce, from my old Berkshire sows, is from nine to fourteen pigs—the younger ones from five to nine. When about to farrow, they should be put into separate pens, otherwise they may overlay or will mutually devour their offspring. Care should be taken not to let them get too fat; as experience having shown, that if they are in very high order, they will not produce as many nor as strong pigs. While suckling their pigs sows should not only be plentifully fed on nutritious food, but should be regularly fed, for if pigs are deprived of their proper nourishment while sucking, they will never arrive at the weight they would otherwise attain.

It is advantageous early, say when they are four weeks old, to accustom the pigs to feed from a shallow trough, on milk, corn meal, ground oats, barley, peas, or buckwheat; boiled potatoes or carrots, mixed with the above is also very grateful to them. This not only gives the pigs a fair start, but very much relieves the sows.

I have my troughs so constructed, that the pigs can be fed without the interference of the mother. (See my plan of a piggery in the first number, page 14, of the present volume of the Cultivator.)

At the end of a week or ten days after farrowing, they may be turned out of their pens into yards, for two or three hours on warm days, in order to stretch their legs, which is far preferable to total confinement.

The best time to wean pigs is when they are from six to eight weeks of age. They should be kept in styes having yards, or if possible, a clover patch for them to run in. Their food should be good; feed often and a little at a time, and as much as they will eat. Boiled or steamed potatoes or carrots, with a little corn meal, ground oats, barley or buckwheat, and where there is a dairy, mix with milk instead of water.

For making pigs grow fast, I never have found any food to compare with the offals of an hotel, or the slop of the dairy. During the weaning, great care should be taken in supplying them with plenty of sweet straw, and to keep them as clean as possible, so that they may always have fine sleek coats; a circumstance this, of such importance, that the want of it can never be compensated by the most plentiful supply of food.

This management is not peculiar to the Berkshire pigs, but will apply equally well to any breed. Sows may be permitted to breed till they are six years old; and the boar may be well until he has passed his fifth year, after which they may be fattened for pork.

For winter food for store hogs and breeding sows, I find roots admirably calculated, such as carrots or ruta baga, given them raw at noon and night and boiled or steamed with a small quantity of ship stuffs or buckwheat bran, mixed and given them warm in the morning. On such food, I kept from fifteen to twenty head during the winter, and I never had them in finer condition.

Charcoal, clay or rotten wood should be given them occasionally; also, a small quantity of sulphur should be mixed with their food, as often as every other week. Their boiled food should be seasoned with salt.

C. N. BEMENT.

*Three Hills Farm, May*, 1838.

### Italian Spring Wheat.

Judge Buel—Dear Sir—It pains me to say that many wheat fields among us show no signs of vegetation; farmers are divided in opinion as to the cause; many impute it to the long continued cold in April, and severe freezing; others to brining *overmuch;* I incline to the latter opinion. Within a few days past, I took a sample of spring wheat from the mill—it had been screened and scoured in the smut machine—one parcel of it I covered with moist earth; another I put into brine, and after twelve hours, took it out and covered as before; the third parcel I put also into brine, it lay twenty-four hours, and then was sown. Of the first parcel, after five days, I did not find one kernel in fifty, but was firmly rooted and sprouted; of the two brined parcels, I did not find either sprouts or roots on a single kernel. Thus I have proof that admits of no doubt, that if Italian spring wheat be soaked in strong brine twelve hours, the principle of vegetation is destroyed. This fact ought to be widely disseminated. Other wheat, of a thicker epidermis may, for ought I know, grow after being steeped half a day in brine, but the Italian will not. I intend to experiment still farther, and ascertain the time that wheat will loose vitality in brine.

Respectfully yours,

J. HATHAWAY.

*Rome, 12th May*, 1838.

NOTE.

We will not pretend to conjecture *why* Mr. Hathaway's Italian wheat did not sprout after being steeped in brine; but we can state as an offsett, that we have soaked seed wheat in pickle, during twenty years practice, including the Italian, without the germinating principle having been destroyed, or apparently impaired. The practice has been general, and the above is the first case which has come to our knowledge, of its having proved prejudicial.—*Cond. Cult.*

### Manures—Madder—Wheat—Butter.

*Pleasant Township, Warren co. near Warren, Pa. May* 5, 1838.

J. Buel, Esq.—I have read the Cultivator from the beginning, and am indebted to it, for much of my limited knowledge of agriculture, having spent the prime of life in other pursuits. So important is this publication in my estimation that I would encourage the

circulation not only among farmers, but all others, who have any taste for rural employment.

The husbanding of manures, and a judicious application of them, has been freely discussed, and has led me to turn my attention to this subject.—I am persuaded that many who are esteemed good farmers, are lamentably deficient in this matter. I think I can now save two loads of manure where I formerly saved one, with the same stock and fodder; and in the application, I have gained much useful information. I practice covering the unfermented yard dung under the sod, and with good success. I am a convert to a rotation of crops, and to root culture—both of which were first suggested by the Cultivator. I have better corn crops, and have improved in skill, in the matter of harvesting. I now cut up my corn, as you recommend. I use ashes applied to the hills.

I obtained from Mr. R. Bronson, 14 bushels of madder, *top roots*, which I planted on light sandy river flats, in the spring of 1836. The ground was rich corn ground, from which I had harvested wheat in 1835, yielding 30 bushels to the acre, the stubble being ploughed in the fall, was again ploughed into ridges or beds six feet wide in the spring, and each alternate bed set out with madder; the intervening beds being planted with carrots, onions, beets, potatoes, and some corn. In June, when all had begun to show themselves handsomely above ground, an unusual freshet overflowed a good part of the field; after it subsided, nothing was left except the madder; this was a little faded, but soon recovered its color, and since then, it has grown beyond any thing I could have expected, from the representation of Mr. Bronson. It has had two summers, and bids fair to cover the whole ground next fall, at which time I shall commence digging, and enlarge my plantation; and it is probable I could supply others with top roots, if applied for in August or September, a little before the time of digging. I intend to let the main crop stand four years.

I have this spring sown, (March 27,) two bushels of winter wheat, prepared as recommended in the Cultivator, No. 4, of the 4th volume, page 64. It is now handsomely up, and looks promising, though the weather has been cold and unfavorable. I obtained one bushel of Italian spring wheat, which I sowed in 1837, the produce of which I am much pleased with, and am now sowing several acres. I think it answers the recommendation given it.

It is said that the Russian mode of making butter is, to scald and churn the milk. In the 1st volume of the Cultivator, page 119, is a description of the dairy farm of Robert Smith, Esq. from which I learn "the cream is raised by steam, produces very sweet butter; it sells in market in summer at 31 cents, and in winter at 50 cents per pound." The butter-milk is represented as being more valuable, &c.

I do not practice the Russian, nor yet the steam method. But for fifteen years past have scalded the milk, as taken from the cows—after which it is set in a cool place till the cream rises. We esteem the butter to be much improved—the skim milk and butter-milk, being free from acidity, are more valuable for culinary purposes, and the trouble of scalding is more than paid by the facility of obtaining the butter by churning. On a fair, impartial trial of milk divided and half scalded, the other half not, in the winter, when all was cold—the scalded cream required thirteen minutes, and the unscalded fifty-six minutes churning; one pound of butter was firm and yellow, the other open, frothy, &c.

Very respectfully,
NATHANIEL SILL.

### Indian Corn, Spring Wheat, &c.

*Ripton, Vt. May 14th*, 1838.

JESSE BUEL, Esq.—Sir—In the number of the Cultivator for the present month of May, page 59, it is stated that Mr. Thorburn sold corn for Dutton corn which proved not to be Dutton corn, as the stalks grew large and were seven or eight feet, whereas the Dutton corn is of rather a dwarfish growth. This corn was probably sold to Mr. Thorburn, by some honest Vermonter, and was undoubtedly the Dutton corn of Vermont.

Not far from thirty years since, Salmon Dutton, Esq. a respectable farmer of Cavendish in this state, procured a new species of corn, and having raised a crop of it, and as it had a very large growth, and was at the same time earlier than the corn that was then generally raised in this state, and believing that the farming interest would be greatly promoted by raising it, in October of the same year he transported a large quantity of it in the ear, to the place where the legislature was in session, and distributed it to the members and others attending the legislature; it was thus distributed through the state, and took the name of the Dutton corn. I took an ear of it and planted it the next season; the stalks grew seven or eight feet high, and were large in proportion to their height. The ears were longer and much larger than any I had before seen, having from 12 to 18 rows on an ear. The cob was very large and the kernels very small and not so flat as the kernels of other corn; and many of the ears, instead of coming to a point at the out end, were flattened and perfectly covered with very small kernels. I raised the corn for several years, and found it somewhat earlier than the then common corn of the country, which I continued to plant. I never ascertained which yielded the most corn by the acre, but considered there was very little difference. The Dutton corn produced at least a third more corn fodder than the other, and yet after having raised it five or six years, I threw it by, finding it very difficult to prevent its moulding on the cob, by reason of its very great size.

About this time, the farmers generally begun to seek for earlier varieties of corn, and several species were produced; among the rest, a species called Rocky Mountain corn. Where it came from I never ascertained; I raised it for several years. This corn was of a dwarfish growth, but the stalks were rather large in proportion to their height—the cob large and the kernel small—from 12 to 18 rows on an ear, and many of the ears were flat at the end, and covered with small kernels, like the Dutton corn; indeed it perfectly resembled the Dutton in every thing but its size. Is this the Dutton corn of New-York?

A few observations in relation to the crops of spring wheat. You justly remark, in the May number of the Cultivator, page 64, that grain which ripens in cold weather, say late in August or September, will be heavier ordinarily, than that which is hastened to maturity in hot weather. By grain, I presume is meant spring wheat, for I have always considered the earlier oats ripen, the heavier is the grain. From this it might be inferred, that spring wheat should be sowed late, without reference to the grain worm; and yet before the appearance of that insect, it was found by experience, that early sown spring wheat was ordinarily the best. By adverting to certain facts which have been noticed by observing farmers, this may be remedied, and every one may be enabled to render late sown spring wheat a very certain and uniform crop, if not an abundant one. Every attentive observer of the wheat crop knows, that when the wheat grows rapidly with a large straw and a broad leaf, with a peculiar deep green color, having the appearance of that which grows about burnt places, or where the land has been manured for crops instead of the preceding one, the straw will most certainly rust and the grain blast; so that by the time the head appears, it may be ascertained with a considerable degree of certainty, whether the straw will be struck with the rust.

Again—it has been observed by every attentive agriculturist, that grain, whether corn, oats or wheat, put into the ground the last of May or first of June, will be much more luxuriant, and there will be a greater growth of stalks and straw, than when put in the ground early. It follows, as I have found by experience, that so long as we are obliged to sow spring wheat late, to avoid the grain worm, we are much more sure of a crop to sow it not on very rich land, but on a medium soil, which will yield from 15 to 18 bushels to the acre, than to sow it on very rich ground. Since I have pursued this course, my crops have been remarkably uniform, never less than 15 nor over 18 bushels per acre, while others who have sown on very rich ground, have in some seasons had from 20 to 30 bushels per acre, have in other seasons had a great growth of straw, but no wheat.

One other remark in relation to the crop of spring wheat shall close this communication, already much longer than I intended when I sat down to give you the foregoing information relative to the Dutton corn. Since I have sown my spring wheat late, and harvested it in September, it has uniformly made a whiter flour than it did formerly when I sowed it early.—This, however, may be owing to its having been harvested in a greener state than formerly. Wheat ripens so very slowly in September, that we are very sure to cut in a green state. I suspect, however, that when the grain ripens in August, the heat of the sun may darken the colour of the flour.

DAN CHIPMAN.

## EXTRACTS.

### Science of Gardening—*in continuation.*

#### ATMOSPHERIC AIR.

All water openly exposed contains more or less of the air of the atmosphere, which consists of two gases, namely, twenty-one parts, by measure, of oxygen, and seventy-nine parts of nitrogen or azote, with, in general, about one thousandth part of carbonic acid gas. It is chiefly owing to the atmospheric air, and a little carbonic acid gas, that common water, though said to be tasteless, is agreeable to drink; for when these are expelled by boiling, it tastes vapid and unpleasant.

That the air contained in the water which enters into plants is important to vegetation, appears from water being found beneficial, in proportion as it has had opportunities of becoming mixed with air. When meadows accordingly are laid under water artificially in the process of irrigation, it is found rather hurtful than beneficial if the water is not kept in motion, but allowed to stagnate.

It is on this account, that the water of rivers which run a long course, is much better for watering than that of springs or lakes, whose waters contain but a small portion of air, though this does not apply so well to the stagnant water of ponds or ditches, whose deficiency as to atmospheric air is compensated by the greater portion of carbonic acid and other substances derived from the decaying animal and vegetable substances usually abundant in such places.

The best water, however, with respect to the quantity of atmospheric air, is rain, which falling in small drops, often tossed about by the wind, has an opportunity of collecting a large proportion of air during its descent to the earth; and hence, the smaller the bore of the holes in the nose of a garden watering-pot the better.

As water becomes mixed with air by exposure and agitation, so does the air become mixed with water by its rising in vapor, and the driest air accordingly always contains more or less water in the state of invisible vapor. The quantity of this vapor is in proportion to the temperature; and hence, the warmer the air the greater proportion of vapor it contains.—A beautiful provision for affording some little refreshment to plants at the very time they are exposed to exhaustion in hot weather, the operation of which we shall afterwards see when we come to consider the use of leaves.

#### CARBON AND CARBONIC ACID GAS.

Carbon is pure charcoal, which is well known and easily proved to form a large proportion of most vegetable substances,—the oak, for example, contains sixty ounces in a cubic foot; consequently the living plant must have the power of deriving it from carbonic acid gas, for it has been proved by the experiments of Sir H. Davy, that the most finely powdered carbon is not taken up by plants in the solid form.—Nothing, indeed, is more hurtful to plants than smoke, which is carbon mixed with watery vapor; though soot, which is condensed and collected smoke, is useful when spread upon the soil, so that water may derive from it a portion of its gases.

All animal and vegetable substances, in a state of fermentation or putrefaction, give out a considerable portion of carbonic acid gas, and if it is not dissipated by heat, but confined on or beneath the surface of the soil, it will become mixed with the moisture there, and be taken up by the spongelets or the roots of plants. A great quantity of carbonic acid is also produced by the breathing of animals and by burning wood, peat or coal; and being heavier than the air of the atmosphere, it must all descend, in the first instance, to near the surface of the soil, into which much of it must be carried by rains and dews. When it becomes diffused in the air, however, its weight has little influence in causing it to descend.

The carbonic acid gas thus mixed with water, and taken up along with it into the system of plants, is there decomposed, as we shall afterwards see, into its constituent parts of oxygen and carbon, part of the oxygen being given off into the air, and the rest with the carbon remaining in the plant, where it goes to form most of the solid parts as well as the nutrient pulp.

The carbonic acid also exists in soils combined with lime, magnesia, iron, and some other substances in the form of carbonates, which are soluble with great difficulty in very small quantities in water, but readily in humic acid, as we shall immediately see.

#### NITROGEN OR AZOTE.

This gas, as we have already seen, constitutes by much the largest portion of the atmospheric air, and consequently must enter largely into the system of a plant, though it is not found in general to contribute so much to vegetable as it does to animal substances, in all which azote is in considerable proportion.

Azote is found in larger quantity in cabbages, savoys, cauliflower, brocoli, sea-kale, turnips, radishes, mustard, and cresses, than in any other garden plants, and it is this which in part produces in these the peculiar acrid taste which most of them possess. It is also a chief ingredient in starch and in the gluten of wheat. It is the nitrogen, also, which, escaping from these when boiled, or when in a state of fermentation or decay, is diffused around and produces an odor in general very strong and disagreeable.

It will follow, that as these plants when healthy, contain much nitrogen, it ought, in rearing them, to be abundantly supplied from its two chief sources—the air and decaying animal substances,—in other words, by free air and animal manure. Though when it is an object, as in the rearing of sea-kale, to ren-

der the flavor mild, the supply of nitrogen must for the reason be diminished.

HUMIC ACID OR HUMIN.*

This important substance was first discovered by Klaporth in a sort of gum from an elm, but it has since been found by Berzelius in all barks; by M. Braconnot in saw-dust, soot, starch, and sugar; and what is still more interesting for our present purpose, it has been found by Sprengel and M. Polydore Boullay to constitute a leading principle in soils and manures. Humin appears to be formed of carbon and hydrogen, and the humic acid of humin and oxygen,† but the difference between the two requires farther investigation. Pure humic acid is a deep blackish brown, without taste or smell, and water dissolves it with great difficulty and in small quantities; consequently it cannot, when pure, be available as food for plants.

Humic acid, however, which, I may remark, is not sour to the taste, readily combines with many of the substances found in soils and manures, and not only renders them, but itself also, easy to be dissolved in water, which in their separate state could not take place. In this way humic acid will combine with lime, potass, and ammonia, in the form of humates, and the smallest portion of these will render it soluble in water, and fit to be taken up by the spongelets of the root fibres.

It appears to have been from ignorance of the important action of the humic acid, in thus helping to dissolve earthy matters, that the older writers were so puzzled to discover how lime and potass got into plants, and it seems also to be this chiefly which is so vaguely treated of in the older books on gardening, &c. under the names of *extractive vegetable extract, mucilaginous matter*, and the like. Saussure, for instance, filled a large vessel with turf, and moistened it thoroughly with pure water; when, by putting 10,000 parts of it by weight under a heavy press, and filtering and evaporating the fluid, he obtained twenty-six parts of what he termed *extract;* from 10,000 parts of well dunged and rich kitchen garden mould, he obtained ten parts of *extract;* and from 10,000 parts of good corn-field mould, he obtained four parts of *extract*.

M. Polydore Boullav found that the liquid manure drained from dung-hills contains a large portion of humic acid, which accounts for its fertilizing properties, so well known in China, and on the continent; and he found it also in peat earth, and in varying proportions in all sorts of turf. It appears probable, from Gay-Lussac having found a similar acid‡ on decomposing the prussic acid,§ that the humic acid may be found in animal blood, and, if so, it will account for its utility as a manure for vines, &c. Dobereiner found the gallic acid convertible into the humic, from which, indeed, it only appears to differ in its water of crystallization.

* In most chemical books, the terms *Ulmic Acid* and *Ulmin* are used, from the Latin *Ulmus*, elm; but as its substance occurs in most, if not all plants, the name is bad. I prefer Sprengel's terms, from the Latin *Humus*, soil.

† The soluble and insoluble *gene* of Dr. Dana.—*Cond.*

‡ Technically, *Azumic acid.*

§ Technically, *Hydrocyanic acid.*

## Young Men's Department.

### Hints to Young Farmers—No. VIII.

REMEMBER CONSEQUENCES.

We once read an interesting anecdote of a young man, who went to spend the Christmas holidays among a group of female cousins. Pawn plays having been introduced in an evening party, the young visitor very unexpectedly declined participating in them. On the company retiring, his cousins surrounded him, and insisted on knowing his reason for not joining in the sports of the evening. Why girls, says he, Aunt Elois makes it a rule never to serve cheese cakes to company; for, she says, if she has cheese-cakes she must have custards, and if she has custards she must have pound cake—and he went on to enumerate a dozen superfluities which must all necessarily follow the introduction of cheese-cakes.—Now, cousins, if I play pawns I must kiss, and if I kiss, I must——his further utterance was stopped by half a dozen hands which were pressed upon his mouth.

*By way of improvement*, we would admonish the young farmer, that his first step in extravagance, beyond what is befitting his business and his means, be it in dress, furniture or equipage, is like serving up cheese-cakes or playing at pawns—the other consequences will follow as certainly as night follows day. Better, by far, take counsel of Aunt Elois,—seek not to entertain company with cheese-cakes, and you may thus reserve to yourselves, for appropriate occasions, both the custards and the kisses.

The natural wants of life are few, and they are most essential to our health and happiness. Our artificial wants are boundless, and the more they are gratified the more they multiply, and the more craving are their demands. He who seeks only to please himself, to study the comfort of his family, and to perform his known duties, depends not, for the enjoyments of life, upon the smiles or favors of others.—But he who, disregarding these, builds his hopes of happiness upon an ostentatious display—upon the applause, mingled as it ever will be with the jealousy and envy, of the multitude, mistakes the true philosophy of life.

While we would caution against extravagance, we are no less opposed to mean parsimony. As men acquire means, they ought to multiply around them the enjoyments of polished—we do not mean by this, fashionable—life. They ought particularly to give to their children those advantages which will fit them not only for usefulness, but for intercourse with the intelligent and respectable classes of society. In truth, the spirit of the age demands, that the children should receive a better education, to qualify them for usefulness, than that which has been bestowed upon the parents.

But in all that may be denominated superfluous expenditures—the man should consult his purse before he consults his wife—or, particularly, his daughters—and, by all means, *remember consequences.*

### Maxims for Farmers.

"*Come boys,*" is the best countersign upon the farm. Even if his hands are not employed, the eyes of the master have wonderful efficacy in accelerating labor.

If you would judge of a man's character, look not at his coat, but at his habits. The first may change with the moon,—or what is the same, with the fashion—the latter are generally as abiding as life.—The first may be the property of another—the latter, like the shadow, belongs exclusively to the man.

Men deserve commendation, not for refraining to do evil, for they may not be in temptation—but for the good they do; not for negative, but for positive virtues.

Every industrious man, by his labor, manual or mental, depends upon his personal exertions for fortune and for fame. Every indolent man depends for subsistence upon the labors of others—upon patrimonial resources, upon trick and fraud, or upon—we mean no personal disrespect by the use of this very appropriate term—the "*spoils*" of office. One adds to the common stock of wealth and human enjoyment—the other adds nothing. The last are like the grain-worms, which consume our crops, without rendering any equivalent to society. Yet as nothing is created in vain, the worm may be intended, perhaps, to excite our constant vigilance, and the man as a living example of human folly—and of the perversion of human faculties.

### Importance of improving the Mind.

Although knowledge and the improvement of the mind have long been considered least necessary in agriculture of any other occupation, almost, in which men are engaged; there is still good reason to believe that there is no other which can be benefitted by it, to so great an extent. Farmers are now beginning to see the importance of science, and the advantages it affords to agriculture. Almost every operation in tillage depends for its results on the chemical combinations of substance and for the food of plants. No calling in life, hardly, may be so greatly benefitted by a thorough knowledge of chemistry. What manures are best applied to particular soils; what to the growth of particular vegetables; the mode of treatment best adapted to the cultivation of particular plants, depend almost wholly on chemical affinity and chemical combinations.

The farmers' interests depend principally on the operation of natural causes; and science has for its object the investigation of nature; therefore science must be deeply interesting to the farmer. A knowledge of natural physics could be turned to good account every day. A man might not know that he wastes his time and money in trying to make water hotter after it boils, or think that by burning green wood he makes a saving; but the science of heat would learn him better. He might think it anomalous that he could not get water up in his pump higher than 33 feet; but pneumatics and hydrostatics would teach him the reason. He might run to a lightning rod for protection in a thunder storm; but a knowledge of electricity would bid him beware. In short, the advantages which science affords to man in every situation in life, are more than he can enumerate.

But science does not alone affect a man's interest. Man has a mind which it is his duty to cultivate. It is adapted to the study of nature, and was no doubt designed for it by our Creator. It is expanded and ennobled by it. Who can consider the adaptedness of man to his situation—how exactly every thing around him is calculated to promote his happiness, and he to enjoy it—the fitness of the eye to the properties of light, conveying to the mind the most exquisite sense of beauty, together with being so useful that, without it, life is almost a burden; and the wonderful harmony which exists throughout nature, without feeling that his mind is enlarged, and that he is wiser and better for it?

Men ought to possess a spirit of inquiry; or, to use a familiar phrase, to get in the habit of philosophising. It is too common for men who have opportunities for improving by a contrary course, to pass over the works of nature without asking or thinking of the cause of the various phenomena around them. No class of men is so favorably circumstanced to profit by the study of nature as the farmer: and yet, few consider that study of less importance. "It is not leisure that mankind needs, (says Robert Mudin, in his Observation of Nature,) it is stimulus and activity; and study, even the most profound and abstruse study, thrives better in the few snatches of time which the busy man can spare for it, than in all the listless and loitering days of him who has nothing to do." If this be true, we see that the general excuse of want of time, is without validity. We have opportunities for study in our every day labor—in our walks for recreation—in every tree and plant—in every change in the atmosphere—in the clouds above our heads, and in the earth beneath our feet—in short, in every natural object or appearance by which we are surrounded. It is the practice of thinking and investigation—of taking notice of what occurs around us, and trying to ascertain the causes of such phenomena and effects as come under our observation, that the mind is rendered active and stored with really useful knowledge. To observe and think are in the power of every man; it merely requires the activity of the mind while the body is in action. The study of nature and the advantages to be derived from it need cost us but little; no expensive apparatus is requisite; we have only to use our natural senses and our minds to gain the desired end.

Consider a little the results and advantages of such observation and investigation. It was by these, that Copernicus, after thirty years study, ascertained the sublime harmony and simplicity of the revolution of the heavenly bodies. It was by these, that the vast mind of Newton, from seeing an apple fall from the tree, was led to inquire and at length to find out the cause—the same cause which keeps our world and the planets in their orbits, and connects the whole material universe of God. James Ferguson, while a shepherd boy, and entirely unacquainted with the name, even, of the sciences, from his observation of the heavens constructed a celestial globe; and finally became an eminent astronomer. Franklin, by his researches in the science of electricity, was enabled to wield the thunderbolts of heaven; and, by his invention of the lightning rod, the forked lightnings descend harmless by the sides of our dwellings. Fulton and Watt, by their observation and reflection, brought the steam engine to its present perfection. And we may say, confidently, that every acquisition to science, and every invention useful to man, has been made, not accidentally, as a general rule, but by the proper use of his reasoning faculties.

Does it become the dignity of a reasoning mind—one whom God has made to bear his own image—to pass through life ignorant of what is going on around him? Yet this is the case with him who will not take the trouble to think. He may, indeed, see, and hear, and feel, and know the existence of many things. So does an animal. Our minds were given us for use. There can be no harm in trying to find out the reason and cause of things which are constantly occurring before our eyes. We could live, and perhaps get along well enough in the world without knowing that air (for instance) is a material substance—that it is by its pressure that water can be raised in pumps—that by its weight, that of our own bodies are lessened, and clouds are formed which water the earth; smoke and deleterious gases ascend: and were it not a material substance, we could not live. We might not know that the vegetable creation absorbs that portion of the atmosphere which animals throw off, and then purify it, so that without the vegetable creation, other than as a direct means of support, no animal could long exist—that thus these two great divisions of nature are constantly supporting each other: we might be ignorant of these facts, and perhaps, feel no inconvenience from our ignorance. We might be able to look out on the orbs of heaven, and recognize in them nothing but twinkling points—as inconsiderable masses, whose faint glimmerings are of very little importance; and yet our world and sun perform their offices as regular, and we receive as much comfort from them as ever, while innumerable suns and systems of worlds roll in that azure void. But, might we not as well have been formed without the power of studying the works of God, as to neglect entirely the use of that power?—The legitimate use of *all* our faculties is best adapted to promote our happiness; and *happiness*, whatever

subordinate ends we seek, is the ultimate object of man's pursuit.

The improvement of the mind is too little regarded by almost all; especially by those whose avocations lead them to active bodily labor. It is too common for this class of men to excuse themselves on account of want of time. "They have so much active bodily labor to perform, that they cannot find time for reading and study." Now this might be a very good excuse, if, for the improvement of the mind, it was necessary for a man to confine himself exclusively to books. But this is not the case. I venture to say, that the man who has received his education and ideas of things exclusively, or principally, from books, is neither a wise nor a useful man. It is the practical manual laborer who combines the education of his mind with his labor, who is best calculated to be useful to the world; and consequently we find, that those who, on the page of history stand most conspicuous for their usefulness, were of this class. Let it not be understood here that I would derogate from the use of books. No: if any art with which man is acquainted should be considered truly sacred, it is that of printing—thus canvassing ideas for the transmission of knowledge. I would say to every young man, read much; read all you can, consistently with your higher duties. But it is the idea that unless a man can spend the most of his time in reading, it is useless for him to try to make himself acquainted with the sciences, that I would combat. Every man, even the most busily occupied, can find some time for reading, without sacrificing his business. Every man needs some time for relaxation from bodily labor.—This is the time, if he can find no other, to be spent in reading: and it can be spent in this way most pleasantly, as one at least can testify. What I would particularly enjoin on my fellow young men is, not to think of *studying* only while engaged with a book; but study while at your labor—in the fields—the forest—every where, and at all times. Nature is the great field for the exercise and development of our mental faculties.

Perhaps some might object to the course recommended, on the ground of its not affording encouragement for pecuniary gain. "They think they could make money faster, without all this trouble of thinking of matters of no consequence." It is a fact that many men consider the great principles of the operations of nature—principles on which depends their very existence, as matters of little importance.—Those who manifest a desire to search out these great truths, especially if it cost them any time, are stigmatized with the odious name of idlers. True, our investigation or knowledge of these principles would not change, or continue them; but it is very far from being true that a knowledge of them is of little importance. To prove this, it will not be necessary to show the superiority of man over an animal—all of us know it. But in what does this superiority consist? Is it in the structure of his body? No, for then you merely make him the more perfect machine. What then? It must be in his mind. Well, if in his mind, in what quality or qualities of the mind does it consist? Is it that man is a *money making* animal? No: it is in his power of reasoning—of investigating the works of his Creator; and in his moral affections. It is in his capacity to trace through the varieties of nature the marks of design and benevolence which lead him up to nature's God.

But aside from this, the improvement of the mind has a direct and most important bearing on the *pecuniary* interests of mankind. This proposition is so self evident as hardly to need illustration. The progress of the sciences depend on the improvement of the mind, or on the power of the mind to trace effects to their causes—and *vice versa*. And it is evident that our pecuniary interests are advanced by an advance of science. By the science of astronomy, and the application of the magnetic properties of iron to the mariner's compass, our ships are enabled to put out into the vast ocean, thousands of miles from land, thus forming channels of communication between different nations, and exchanging the commodities of different countries. By the scientific application of steam to machinery, we have our steam-boats and rail-road cars; and an engine capable of performing almost any kind of labor. So in instances without number, science contributes to the necessities and comforts of man.

More than this; the improvement of the mind is a positive duty: one of the highest duties enjoined on man. It is a duty we owe, both to our Creator and to ourselves. We owe it to our Creator; He has given us a perfect law and standard of action, and commands us, under the severest penalties, to observe and obey them; while that obedience is its own reward. It improves the moral faculties of the mind, and therefore tends to render us happy. We owe it to ourselves; because we ought so to act, keeping the great object of our existence in view, as best to attain the end. We are commanded to "prove all things." We are not called on in the word of God, or in the works of nature, to believe any thing which is opposed to reason. We *cannot* do it. It is contrary to the constitution of mind. We may be, however, and are, bound to believe many things which reason cannot explain or account for. Therefore it is necessary to be able to distinguish between what is reasonable and what is unreasonable, in order, as the scriptures express it, to "hold fast that which is good."

Thus I have attempted to show the advantages of science to agriculture—the feasibility to the farmer of the improvement of the mind by the study of nature—the results of that study—the degradation consequent on its neglect:—that the improvement of the mind is a matter of interest, and that it is a duty. The object of writing this brief essay was to impress on the minds of young men, particularly those engaged in agricultural pursuits, the importance of the improvement of the too much neglected mental faculties. It is truly the mind that makes the man. It is in the power of almost every young man to make himself distinguished for usefulness to the world: though the usefulness should be the motive, and not the being distinguished. "Nothing is of any value, except that which costs us labor." The improvement of the mind will require some exertion. We must expect it: for, like every thing else valuable, it is not to be attained for nothing. But the results of this labor will fully compensate all those who undertake it.

*Albany, May*, 1838. P.

## Chemical Catechism—Chapter II.

### OF ATMOSPHERIC AIR.

*What are the obvious properties of atmospheric air?*

Fluidity, elasticity, expansibility and gravity.

*What do you mean by the elasticity of the air?*

If atmospheric air be compressed into a small compass, it has the property of recovering its former state as soon as the pressure is removed, which is called its elasticity.(*a*)

*What is meant by the expansibility of the air?*

The expansibility of the air is its property of being rarified by heat, so as to occupy a larger space than it would at a lower temperature.(*b*)

*How far does the atmosphere extend?*

The atmosphere is several miles high, but it is so very much attenuated at considerable heights, that it cannot be ascertained how far it actually does extend.

*What are the various uses of the atmosphere?*

The atmosphere is necessary for the support both of animal and vegetable life.(*c*) It is indispensable in all the common processes of combustion; it ministers to several of the pleasures which we derive from our senses;(*d*) it gives buoyancy to the clouds, and enables the feathered creation to transport themselves from one part of the earth to another.

*But what is the use of the atmosphere being so extended so far above the surface of the earth?*

It is this great extension of the air which occasions it *weight;* and the pressure of such a weight produces many important effects in the economy of nature.(*e*)

*What are the effects of the weight of the atmosphere?*

It is owing to the weight of the atmosphere that we are enabled to raise water from beneath the surface of the earth by the common pump,(*f*) and to perform many other useful operations.

*What other advantages do we derive from this extension of the atmosphere?*

If we had little or no atmosphere, we should have no cold water; for the waters on the face of the earth would all evaporate at a very inferior temperature;(*g*) besides, the arterial vessels of all organized beings, would be so constantly distended, that animal and vegetable life would be endangered.

*How are waters and other fluids preserved to us by the weight of the atmosphere?*

The weight of the atmosphere, pressing on the water, binds it down as it were, and prevents the usual heat of the sun from converting this and all other fluids on the face of the earth into vapor.

*How does the weight of the atmosphere operate so as to be beneficial to the animal and vegetable creation?*

The uniform pressure of the atmosphere on the *exterior* of all organized beings, counterpoises the *internal* pressure of the circulating fluids, and preserves the vessels in due tone and vigor.(*h*)

*What is the weight of the atmosphere?*

Each square foot of the the earth's surface sustains about 2,160 pounds of atmospheric air. A column of air an inch square weighs about fifteen pounds.(*i*)

*What other advantages do we derive from this immense atmosphere?*

The great density of the atmosphere gives a proper temperature to the rays of the sun: it also reflects those rays so as to give a lucid brightness to every part of the heavens, and is the cause of those dews and rains which make the earth fruitful.

*What is the real nature of the air which forms the atmosphere of this earth?*

This immense atmosphere is composed of oxygen and nitrogen, two different airs, which are intimately mixed in certain definite proportions.

*Are oxygen and nitrogen the only substances which enter into the composition of the atmosphere?*

No; atmospheric air contains also about one part in every thousand of carbonic acid gas, and several adventitious substances.

*What other substances are found in atmospheric air?*

Besides carbonic acid gas, it holds a portion of water in solution; and sometimes contains hydrogen and carburetted hydrogen gases.

*What are the sources of these other gases?*

Carbonic acid gas is constantly formed by the respiration of animals and by combustion: and hydrogen and carburetted hydrogen gases arise from various sources, particularly from marshes, stagnant pools, &c. all which are prejudicial to the animal creation.

*If carbonic acid air and carburetted hydrogen air are prejudicial to animal life, how are they corrected in the atmosphere?*

These airs, which would cause the death of any animal obliged to breathe them, are the proper nutriment of vegetables, and nature has endowed them with organs for their decomposition.

*You have spoken of different gases—what do you mean by gas?*

When solid substances are rendered perfectly aeriform by heat, the air thus produced is called a gas, (*j*) to distinguish it from those aeriform substances which return to the solid or fluid state when the heat is removed.

*Is there any chemical means of analyzing atmospheric air?*

By the operation of different agents, the separate gases may be separated from each other, and the quantity of each ascertained.

*Do you know the proportions of the different gases in atmospheric air?*

There are about 21 parts of oxygen gas, and 79 of nitrogen gas, in every 100 measures of atmospheric air, or nearly 23¼ of the former and 76¾ of the latter, if the calculation be made by weight.

*Is there much difference in the nature of these gases?*

The oxygen gas in atmosphere air is the principal supporter of combustion, and the vehicle of heat; and is, as was before mentioned, absolutely necessary for the support of animal life.

*What is the nature of oxygen gas, when in a separate state?*

Pure oxygen gas has the property of accelerating the circulation of all the animal fluids, and occasions the most rapid combustion of all combustible substances; so that it is the most energetic and powerful agent that we are acquainted with.

*What is the specific gravity of oxygen gas?*

Oxygen gas is a little heavier than atmospheric air, and about 750 times lighter than water.

*What are the principal properties of nitrogen gas?*

Nitrogen gas, or azote, is chiefly distinguished by certain *negative* qualities, such as its being incapable of supporting combustion and animal life,(*k*) it is uninflameable, and somewhat lighter than atmospheric air.

*Seeing that nitrogen gas is injurious to animal life, what is the use of so large a quantity of it in atmospheric air?*

Nitrogen gas has the effect of neutralizing, in some measure, the properties of oxygen gas, and rendering it fit for respiration and combustion.

*How is this change effected by nitrogen gas?*

By the union of nitrogen gas with oxygen gas: the latter is so diluted and modified as to prevent combustion from being too rapid and respiration too stimulating; and by the due proportions in which these gases constitute the atmosphere, the compound possesses properties so different from either of them as to be admirably fitted for every purpose for which it was designed.

*How does atmospheric air support life?*

By giving out its oxygen and caloric to the blood.(*l*)

*What do you mean by caloric?*

Caloric is the name which modern chemists have given to fire, or the matter of heat; a large portion of which is intimately combined with atmospheric air.

*Is the caloric which is combined with the air we breathe, sufficient of itself, to keep up the necessary heat of the body?*

Animal heat is preserved chiefly by the inspiration of atmospheric air. The lungs which imbibe the oxygen gas from the air, impart it to the blood; and the blood, in its circulation, gives out the caloric to every part of the body.(*m*)

*How do clothes conduce to preserve the heat of the body?*

As the temperature of the atmosphere in this climate is always inferior to the animal temperature, clothes(*n*) are necessary to prevent the sudden escape of that heat from the surface of the body(*o*) which the lungs have separated from the atmosphere.

*What becomes of the nitrogen which was combined with the oxygen in atmospheric air?*

The greatest part of the nitrogen is thrown out of the lungs at every respiration; and being somewhat lighter than atmospheric air, it rises into the atmosphere to await fresh combinations.

*What provisions has nature made for restoring the vast quantity of oxygen which respiration and combustion are perpetually taking from the atmosphere?*

The leaves(*p*) of trees and other vegetables give out during the day, a large portion of oxygen gas,(*q*) which, uniting with the nitrogen thrown off by animal respiration, keeps up the equilibrium, and preserves the salubrity of the atmosphere.

*Is this perpetual renovation of the atmosphere owing to a fortunate concurrence of circumstances, or is it the effect of design and contrivance?*

When we recollect the various processes of nature and of art, which concur with respiration and combustion, in depriving the atmospheric air of its oxygen; and that, notwithstanding the atmosphere uniformly contains every where the same proportion of this gaseous substance, we can attribute the renovation to nothing but design, and perceive in it a proof that the laws of nature must be referred, not to blind chance, but to unerring intelligence combined with infinite goodness.

NOTES.

*(a)* It is now generally supposed that the air owes its elasticity to *caloric*, and that if it could be entirely deprived of the matter of heat, it would loose its elastic form.

The rebounding of a common foot ball would be a familiar instance to explain the elasticity of the air to a child; also the bubbles of air rising from the bottom of a glass of water, which will be seen to dilate as they rise to the surface, owing to the pressure of the liquor becoming less and less upon them.

The air gun and the forcing pump are constructed on this principle of elasticity. It is by this property of the air that fishes are enabled to rise and sink in the water; nature having furnished them with an *air bladder;* which they have the power of contracting or dilating at pleasure. When a fish compresses this bladder, its whole volume becomes less, and it sinks in the water, when the pressure is removed, the air within the bladder instantly expands, and then it is enabled to rise.

*(b)* If the neck of a bladder, containing a small quantity of air, be closely tied up and held to the fire, the swelling of the bladder, by the rarifaction of the air within it, will afford an idea of the *expansibility* of the air.

Mr. Robins has calculated that the air which is disengaged in the firing of gun-powder, is rarified by the heat so as to occupy a thousand times the space of the whole of the gunpowder employed.

*(c)* It has been ascertained by experiment that no other gaseous body with which we are acquainted, can be substituted for atmospheric air. All the known gases have been tried; but they all prove fatal to the animal which is made to breathe them. Even water absorbs air when exposed to the action of the atmosphere, and thence becomes a fit element for the various tribes of creatures who inhabit it.

"The vital air
Pervades the swarming *seas* and heaving earths,
Where teeming nature broods her myriad births;
Fills the fine lungs of all that *breathe* or bud,
Warms the new heart, and dyes the gushing blood;
With life's first spark inspires the organic frame.
And, as it wastes, renews the subtle flame."—*Darwin.*

It is to the presence of air that water is indebted for its agreeable taste. Boiling deprives it of the greatest part of it; hence the insipidity of boiled water.

*(d)* In the use of atmospheric air, *man* is the only being who gives to it all the modulations of which it is susceptible. With his voice alone he imitates the hissing, the *cries*, and the melody of all animals; while he enjoys the gift of speech denied to every other. To the air also he sometimes communicates sensibility: he makes it sigh in the pipe, lament in the flute, threaten in the trumpet, and animate to the tone of his passions even the solid brass, the box-tree and the reed. Sometimes he makes it his slave; he forces it to grind, to bruise, to move for his advantage an endless variety of machines. In a word, he harnesses it to his car, and obliges it to waft him over the stormy billows of the ocean.

*(e)* The pressure of the atmosphere may be shown by a very simple experiment. Place a card on a wine-glass *filled* with water; then invert the glass, and the water will not escape; the pressure of the atmosphere [upwards] on the outside of the card being sufficient to support the water.

*(f)* In this operation the atmosphere presses equally upon the whole surface of the water in the well, until the rod of the pump is moved; but, by forcing the rod down, the bucket compresses the air in the lower part of the pump tree, which being elastic, forces its way out of the tree through the valve; so that, when the bucket is again raised, that part of the pump tree under the bucket is devoid of air, and the whole *weight of the atmosphere* pressing upon the body of water in the well, forces up a column of water to supply its place; the next stroke of the pump rod causes another column of water to rise, and so long as the bucket fits the pump tree so as to produce a vacuum, a constant stream of water may be drawn from below. A common syringe will show the action of atmospheric air in pumping.

*(g)* It is the principle of *evaporation producing cold* that occasions the injury which persons sustain by sitting in wet clothes. It is not the water that hangs *upon* them that produces the mischief, but the sudden loss of a large portion of caloric, which is carried off from the body by the evaporation of this water. If a healthy person were closely covered up with his wet clothes, so that no evaporation could take place, he would probably sustain no injury.

*(h)* Were it not for the weight of the atmosphere constringing the vessels in animals and vegetables, the elastic fluids contained in the fine vessels, would inevitably burst them, and life become extinct.

Persons who have delicate constitutions need not wonder that they are generally much affected by a change in the atmosphere, when they learn, that often in the course of a few hours, there is an increase or diminution of one hundred weight, and from that to half a ton weight, of atmospheric pressure, on each individual, while the *internal pressure* of the circulating fluids remains the same. Supposing a man's body to contain fifteen square feet of surface, (which is near the truth,) he will sustain a body of air of upwards of fourteen tons weight. But it is necessary to remark, that the air presses upwards, downwards and sideways, in every direction, and that it is owing to this equal pressure that we are not injured by the vast weight of the atmosphere; for the equal pressure on all sides resists as much as it is resisted.

*(i)* A column of air of the height of the atmosphere, when greatest, is equal to a column of water 35 feet high, or a column of mercury of the same size 30½ inches high. Hence water will not rise in a pump more than 35 feet, nor mercury in a barometer stand higher than 30½ inches. A quart measure of atmospheric air weighs about 17¼ grains.

*(j)* All the gases are compounds of solid matter and caloric. It is caloric which separates the particles, and gives to the whole a gaseous form.

*(k)* Nitrogen forms a part of all animal substances. It is also the base of ammonia, and of the nitric acid. It appears to be favorable to plants, as they grow and vegetate freely in this gas. It seems to be the substance which nature employs in converting vegetables to animal substances, and to be the grand agent in animalization.

*(l)* By the rise of the breast bone in man, and the descent of the diaphragm, room is afforded for 42 cubic inches of atmospheric air at every drawing in of the breath. A deeper inspiration will give room for more than twice this quantity.

*(m)* According to Lavoissier, a man generally consumes 32 ounces troy of oxygen gas in 24 hours; that is, the lungs separate this quantity of oxygen from the air which he respires in that time.

*(n)* Clothes keep the body warm in consequence of the air which they infold within them; all confined bodies of atmospheric air being non-conductors of heat. It is on this principle that double windows preserve the warmth of apartments at an equable temperature. In like manner, double lids for boilers, are found to be very effectual for preserving the heat of the liquor with a very small portion of fuel.

On this principle it is that light spongy substances, such as furs and down, afford the warmest clothing. Hence it is that the carpet of snow which covers the earth in winter, is spread out by nature with so light a hand, that it might hold an abundance of atmospheric air within its interstices, to preserve the warmth of those innumerable tribes of vegetables which it is destined to protect.

*(o)* We clothe ourselves with wool, because it is a bad conductor of heat, and retards its escape from the body.—The inhabitants of Russia, clothe themselves in fur, because fur is still a worse conductor of heat than wool. Sheep are natives of a temperate climate; but the bear and the ermine of the coldest. The provident care of the Creator is evidently conspicuous in this appointment, and discovers the same undeviating attention to the comfort of all his creatures; hence the clothing of animals in the torrid zone is hair, in the temperate zones wool, in the frigid thick fur.

*(p)* The *upper* side of the leaf is the organ of respiration: hence some vegetables (as they give out oxygen only in the day,) close the upper surfaces of their leaves during the night. The multiplicity of the leaves of trees indicates the importance of transpiration to a vegetable.

*(q)* To show the production of oxygen gas from the leaves of plants, fill a glass bell with water, introduce some fresh leaves under it, and place the bell inverted in a flat dish of water. Expose the apparatus to the rays of the sun, and very pure oxygen gas will be disengaged, which will displace the water in the jar, and occupy its place. In like manner, a sprig of mint, corked up with a small portion of carbonic acid air, and placed in the light, will absorb the carbon and render the air again capable of supporting life. The plant purifies what the animal had poisoned.

All the oxygen, however, is not given out by plants; part must be retained to form the sugar and acids which are found in vegetables.

### Horticultural Association of the Valley of the Hudson.

☞ A meeting was called for the 30th May, to be held at the rooms of the Lyceum of Natural History, 563 Broadway, N. York, to organize an association, under the style of "The Horticultural Society of the Valley of the Hudson." The objects of the association are to facilitate the introduction into our orchards and gardens, and of disseminating, all the choice kinds of fruits and vegetables which are adapted to our soil and climate, and of improving our taste for the rural embellishments and ornamental gardening—objects highly conducive to the comfort and rational enjoyment of all classes of the community. The circular calling the meeting, bears the names of several highly respectable gentlemen and professional gardeners, and invites the attendance of all who are anxious to promote the objects of the association.

### ☞ Ruta Baga Seed.

A parcel of genuine *purple top* Ruta Baga Seed has been left at the Cultivator office, in half pound papers, for sale, by a gentleman who imported it direct. Price 75 cents per lb.

*Moneys received during the last month, in sums of five dollars and over. The total receipts are included from post-offices marked with an asterisk.*

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## PRICE CURRENT.

| ARTICLES. | | New-York. May 21. | Boston. May 19. | Philadelphia April 18. | Baltimore May 20. |
|---|---|---|---|---|---|
| Beans, white, | per bush. | | 1 20.. 1 50 | 1 00.. 1 12½ | 1 00.. 1 12½ |
| Beef, | cwt. | 8 00..11 00 | 8 25.. 9 | 7 00.. 9 00 | 9 00.. 10 |
| Bacon, western, | lb. | 10.. | 12 | 8 00..10 | 9.. 10 |
| Butter, fresh, | lb. | 22.. | 18.. | 14.. | 20.. |
| Cheese, | lb. | 7.. 9 | 8.. 10 | 9.. 10 | .. 12½ |
| Cotton, best, | lb. | | 25 | 12½ | 25 |
| Flour, best, | bbl. | 7 50.. 8 25 | 8 00.. 8 50 | 7 87½.. 8 00 | 7 75.. 8 00 |
| GRAIN—Wheat, | bush. | 1 62½ 1 92 | 1 40 | 1 37½.. 1 40 | 1 70.. 1 75 |
| Rye, | bush. | 1 05.. 1 10 | .. 65 | .. 75 | .. 75 |
| Oats, | bush. | 35.. 40 | .. 40 | .. 40 | .. 40 |
| Corn, | bush. | 80.. | .. 1 00 | .. 95 | .. 94 |
| Hams, pork, | lb. | 12 | 12 | 10.. | 13 |
| Pork, in log, | cwt. | 12 00..13 00 | 14 | | |
| SEEDS—Red Clover, | bush. | | .. 15 | 10.. 11 | 12½ |
| Timothy, | bush. | 3 | 3 | | |
| Wool—Saxony, fleece, | lb. | 50 | 9 | 3 00.. 3 50 | 3 00.. 3 50 |
| Merino, | lb. | 2 | 2 12½ | 2 | 2 |
| 1-4 and com. | lb. | 38 | 50 | 48.. 50 | 50 |
| Sheep, | head. | 2 92 | | 3 | 3 |
| Cows and Calves, | | | | 25 | 25 |
| | | 30 | 27 | 20 | 35 |
| | | .. 45 | .. 35 | .. 38 | .. 40 |

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